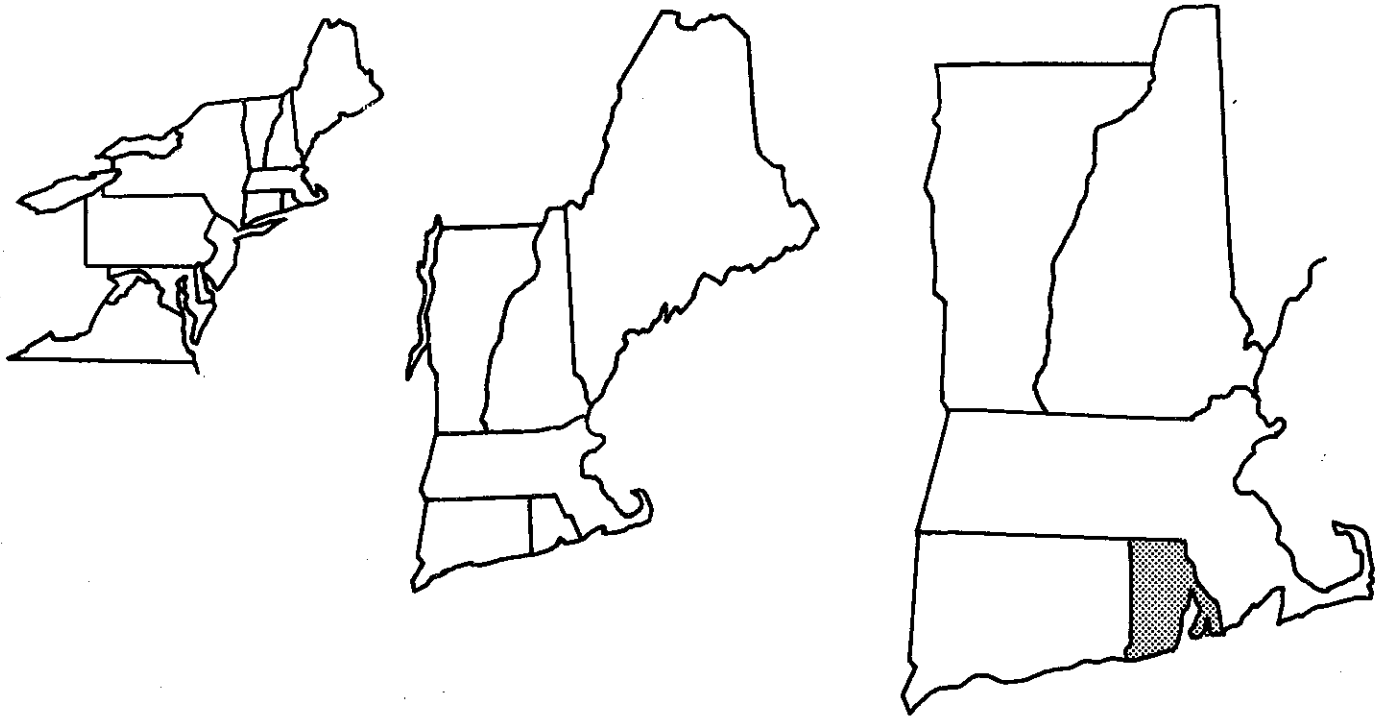
NORTHEASTERN UNITED STATES WATER SUPPLY STUDY

SITE PRESERVATION FOR WATER RESOURCE PROJECTS



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Site Preservation for Water Resources Projects

A Legal, Economic and Institutional Analysis

Prepared for

Department of the Army
New England Division, Corps of Engineers
Waltham, Massachusetts 02154

by

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December 29, 1972

Department of the Army
New England Division,
Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

RE: Contract No. DACW 33-72-C-0051
Advance Land Acquisition Study

Gentlemen:

We are pleased to submit 100 copies of the final report resulting from the referenced study.

We would like to take this opportunity to extend our thanks to the many individuals representing Federal and State agencies who have contributed so generously of their time to help our efforts in this study. Special mention should be made of such help obtained from the personnel of both the Planning Branch and Real Estate Branch of the New England Division. Within Rhode Island, special thanks are due not only to the Water Resources Board and other State agencies, but also to the community leaders and residents of the towns in Rhode Island who shared their thoughts with us on the proposed acquisitions of land in their communities for water supply reservoirs.

Personnel within Curran Associates who have contributed to the study have included Peter Meier, David Cochrane, Sherrill Livingston, Alan Asikainen, and Florence Helfand.

Assistance with the legal aspects of the study was obtained from Attorneys Janet R. Dugan and Edward J. McMahon. Edwin H. Clark, III provided significant assistance in economic considerations, while Joseph Bradley played an important role in comprehensive planning aspects of the study pertinent to the Rhode Island area.

Engineering, legal, economic, urban planning, and sociological viewpoints are represented in the study. The resulting report has been written in a format to be used by professionals working in the field of water resources.

Again, we have enjoyed the opportunity of working with the Corps of Engineers on this study and of contributing to the area of knowledge relating to preserving sites for water resource projects.

Sincerely yours,

Robert G. Curran

Robert G. Curran, P.E.
President

RGC/dm

Table of Contents

Table of Contents Continued

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1 GOALS AND OBJECTIVES OF THE STUDY

This study has three major objectives:

1. To investigate methods historically employed to assure that certain tracts of land will be available in the future for water resource development projects, to evaluate the success of these various methods, and to evaluate each of the methods as it pertains to the New England area.

2. The collection and interpretation of information that is necessary so that judgment can be made of the probable effects of advance acquisition of land for contemplated water resource development projects.

3. To analyze the history and problems of reservoir site preservation in the State of Rhode Island, and to develop a planning program to resolve these problems.

The paucity of technical literature on reservoir site preservation, and the total absence of statistical data, has made a rigorous separation of general methodology and case studies impossible. Thus, while the planning program developed in the case studies serves to illustrate the application of principles developed in the methodological chapters, information assembled for the case studies has also provided a major input to the development of these planning principles, for example, in the identification of costs and benefits. Only the review of legislation could be based on an independent data source, namely the statutes of the states concerned.

The remainder of Chapter 1 will define the need for advance land acquisition in New England, and Chapter 2 will introduce the methods of site preservation for purposes of introduction to the general reader and to define terminology. This will be followed by a detailed comparative analysis of pertinent Federal and State legislation in Chapter 3 and the development of a framework for economic analysis and a systematic identification of the costs and benefits of site preservation in Chapter 4.

Chapter 5 contains an analysis of some of the sociological issues and problems related to advance land acquisition; Chapter 6 examines the institutional aspects and establishes the elements of an optimal planning strategy for reservoir site preservation programs. The Rhode Island case study is contained in Chapter 7, and finally, Chapter 8 presents a summary and conclusion.

1.2 THE NEED FOR RESERVOIR SITE PRESERVATION

Today it is widely recognized among planners, municipal, state and Federal agencies that the water resources of the United States must accommodate the growing needs of the nation. Comprehensive river basin studies, municipal water supply reports, as well as recommendations to Congress have all emphasized the importance of preservation of potential reservoir sites. However, in spite of the efforts by planners to preserve such resources, potential reservoir sites are subject to various types of encroachments. Specifically, Olsen notes in his monograph[1] that the nation's burgeoning population is at the center of the difficulty. Not only does it demand water supply, but it also demands acreage for residential, industrial or recreational development, developments which often signify the loss of these self-same reservoir sites so desperately needed for water resources projects! Olsen chooses the Philadelphia-Camden-Trenton area to illustrate this point:

> . . . the total acreage of land developed for urban uses has increased by 46 percent in the fifteen-year period ending in 1960. And even though the 163 square miles of land developed in those fifteen years represented only about one-fifth of the total available, it included a significant amount of the more desirable land sought after by water resource planners.[2]

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[1] Olsen, G., "Preservation of Reservoir Sites," Regional Science Monograph #1, University of North Carolina, Center for Urban and Regional Studies, Chapel Hill, 1964.

[2] Ibid., p. 2.

But, as noted by Kneese,[3] there can be some good economic reasons for not preserving reservoir sites. In Kneese's words,

> ...the reason is that the increase may reflect the high value of these sites for other purposes than reservoirs. For example, they are often of particular value for recreation (rugged country), forestry (hardwoods), residences (natural beauty), and the like. Demand for land for these purposes is generally rising quickly. These 'opportunity' costs should be considered in cost-benefit analysis and, under some circumstances, free market land prices register them accurately.[4]

In theory, if the market for land is competitive, if buyers and sellers are fully informed (including knowledge of time when lands will be converted to reservoir use), and if compensation at time of conversion is calculated correctly, to exclude speculative elements and to include only the value of the land in its best alternative use, there will be no legitimate economic reason for preserving sites through zoning or other measures. In other words, the costs of the reservoir should fully reflect the value of the site in alternative uses and only that value.[5]

But, in practice, the market mechanism for land is quite different from this idealized situation. Two specific examples will illustrate the problems that reservoir site encroachment impose on acquisition of the designated land and on the desired operation of the land market. The evidence substantiates the need for early site acquisition or preservation.

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[3]Kneese, A.V., "On Reservoir Site Preservation Policy," Water Resources Research, Vol. 2, No. 3 (1966).

[4]Ibid., p. 607.

[5]Ibid., pp. 608-609.

1.3 EXAMPLES OF RESERVOIR SITE ENCROACHMENT.

1.3.1 The Gaysville Dam and Reservoir Project, Vermont.[1]

In 1936 the Gaysville Dam and Reservoir was authorized to provide flood control storage for the White River, as one of a series of flood control projects proposed by the Corps of Engineers for the Connecticut River basin (Fig. 1-1). For a variety of reasons, implementation of the Gaysville project has been repeatedly delayed,[2] and is not constructed at the time of writing. In the meanwhile, however, the character of the site has changed dramatically.

The transition of the proposed reservoir site and its environs from an essentially rural-agricultural area to one under intense pressure from nearby ski resort development, is documented by the series of preliminary estimates of land costs prepared by the Real Estate Branch of the Corps of Engineers. Originally, the major part of the reservoir site consisted of good valley farm land. Located along the

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[1] This case study is based on unpublished reports and appraisals of the New England Division, Corps of Engineers. The assistance of the Real Estate Branch is gratefully acknowledged.

[2] See "Gaysville Dam and Reservoir, White River, Vermont," Restudy, September, 1967, Department of the Army, New England Division, Corps of Engineers, Waltham, Massachusetts.

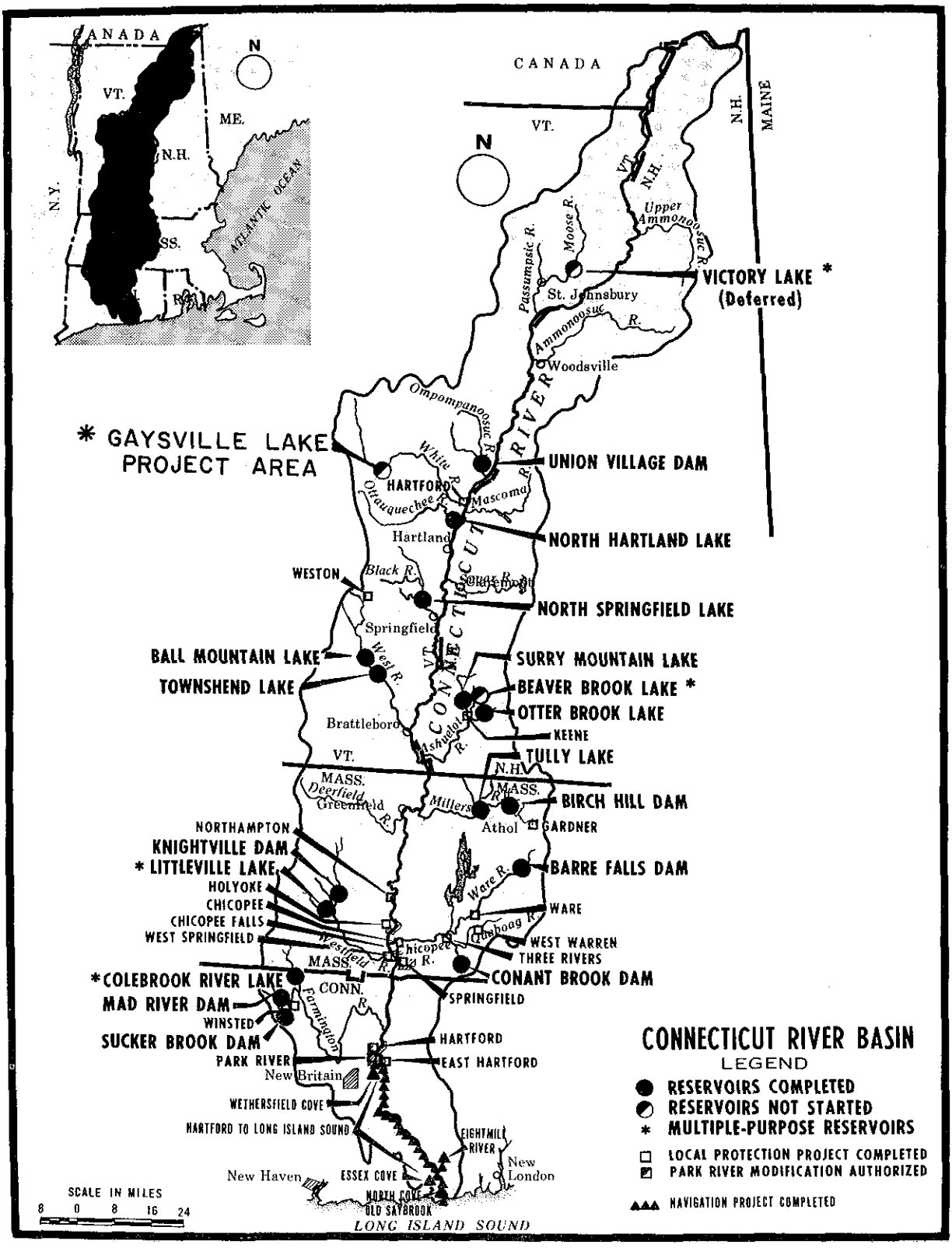

Figure 1-1: Gaysville Project Area

(Source: Water Resources Development in Massachusetts, U. S. Army Corps of Engineers, New England Division, 1971)

river banks, on level and fertile land, most farms produced corn, alfalfa and hay, with pastures on the adjacent foothills. The hillsides were mostly wooded. But, by 1951 there were few active farms of any size, and there were first indications that several had been bought up for summer residences or by retired people who obtained partial subsistence from the land.[3] This transition accelerated markedly with the rapid development of several nearby ski resorts in the early sixties. Many farmers located in the project area had converted or added buildings for ski lodges as a source of supplementary income. There was also a demand for sites for private chalets and winter homes.[4] Other homes were purchased by outsiders and rehabilitated. As shown on Table 1-1, the number of residences in the project area more than doubled between 1958 and 1969.

The impact of these pressures on the estimated project costs are shown on Table 1-2. The percentage of total project cost attributable to acquisition of land and damages rose from 5.2% in 1956 to 12.1% in 1967. Although the Gaysville project is the subject of some controversy,[5] it nevertheless

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[3]Preliminary Estimate of Land Costs, Gaysville Reservoir, March 8, 1951.

[4]The Preliminary Estimate of May 12, 1958 noted that only one new home had been built in the proposed taking area between 1951 and 1958. But between 1965 and 1967 eight A-frame dwellings were built in a chalet village located in the proposed site.

[5]See, among others, Report of the Citizen Review Committee on the Connecticut River Basin, February 1971, p. V-34.

Table 1-1: NUMBER OF IMPROVEMENTS AT THE GAYSVILLE DAM AND RESERVOIR SITE, VERMONT FROM 1947-1969

	1947	1951	1958	1965	1969	1970
Residences	53	53	43	74	93	133
Farms	36	36	33	30	19	9
Commercial	4	4	8	9	10	12
Industrial	2	2	1	1	1	1
Total	95	95	85	114	123	146

SOURCE: U.S. Army Engineer Division, New England, Corps of Engineers, Real Estate Division, Preliminary Estimates of Real Estate Costs.

Table 1-2: IMPACT OF DEVELOPMENTS ON PROJECT COSTS (in 1000$)

	1956	1967
Lands and Damages	985 (5.2%)	3,030 (12.1%)
Relocations	6,735 (35.6%)	10,050 (40.2%)
Other	11,180 (52.2%)	11,920 (47.7%)
Total Project First Cost	18,900 (100.0%)	25,000 (100.0%)

SOURCE: As Table 1-1

illustrates the point that, in the absence of suitable land-use controls or advance land acquisition, real estate costs at reservoir sites can rise substantially in even remote rural areas.

1.3.2 The Allenstown Dam and Reservoir Project, New Hampshire.[6]

The escalation of real estate acquisition costs in the Allenstown (New Hampshire) Dam and Reservoir project site area can be ascribed to the pressures of nearby urban areas. The site is in the vicinity of Concord and Manchester, New Hampshire, as shown on Figure 1-1, both of which have grown substantially in the period between initial consideration of the site and a re-evaluation some twenty-four years afterwards.

At the time the project area was first examined in 1947 by the Appraisers of the Corps of Engineers,[7] the site was essentially in agricultural land use or undeveloped, with but

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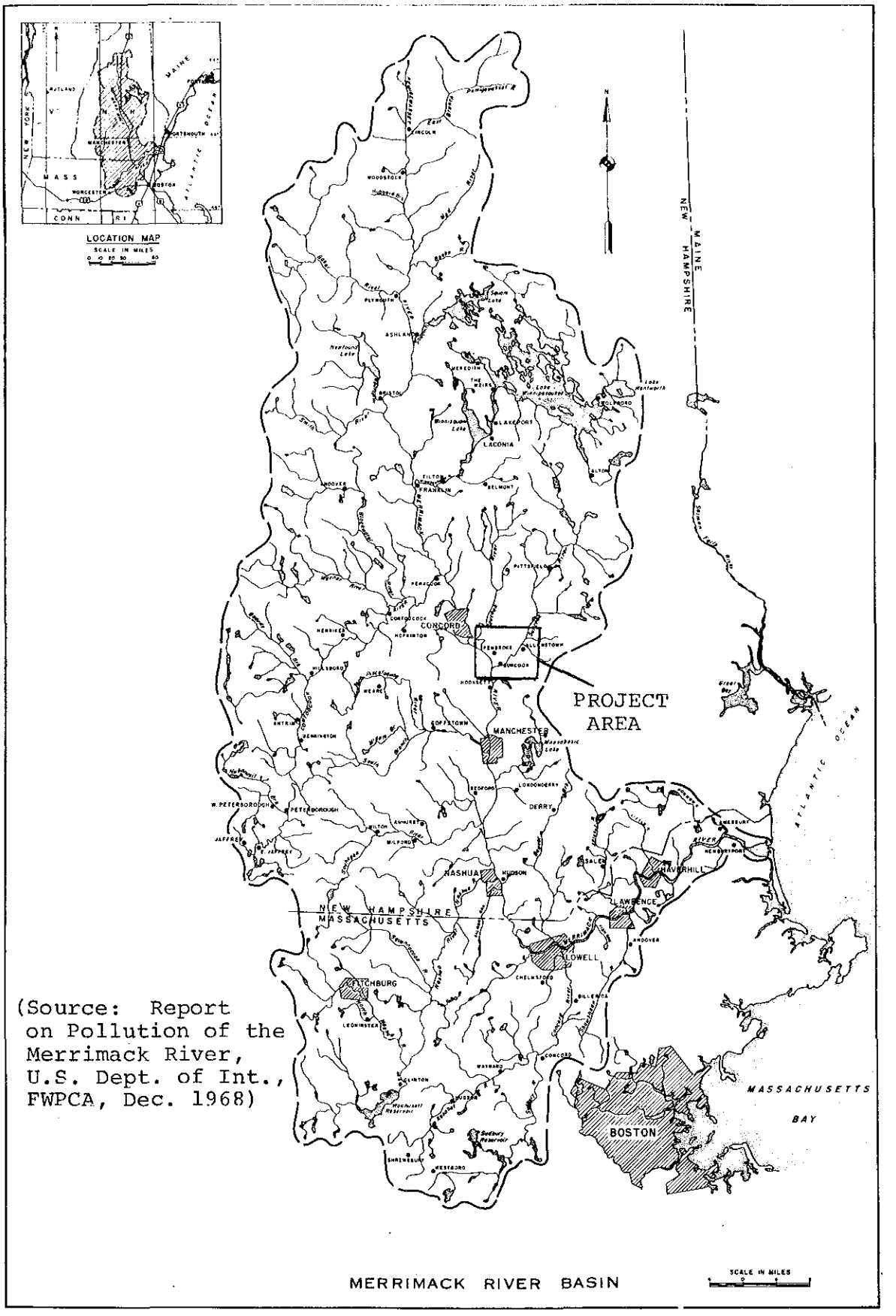
[6] This case study has also been assembled from mostly unpublished material of the Real Estate Branch, New England Division, Corps of Engineers.

[7] "Preliminary Estimate of Land Costs, Allenstown Reservoir," unpublished memorandum, Real Estate Branch, New England Division, Corps of Engineers, January, 1947.



(Source: Report on Pollution of the Merrimack River, U.S. Dept. of Int., FWPCA, Dec. 1968)

Figure 1-2: Allenstown Project Area

few residences as documented on Table 1-3. But, at the time of a second investigation,[8] some twenty-four years later, the character of the area had changed completely, as noted by the Appraiser:[9]

> The area is in transition from agricultural farmland to residential and recreational use. Seventy-five percent of population work in Manchester or Concord, N.H. Favorable real estate taxes, good roads and access to shopping centers nearby create a very desirable residential and recreational atmosphere which is shown by the increase of new homes and trailer parks within the last few years.[10]

This change is illustrated on Table 1-3; at the same time, the costs for land taking of a roughly comparable area increased from about $1.0 million in 1947 to $7.7 million in 1971. Although inflation may be responsible for a substantial portion of this escalation, the cost of capital improvements on the projected site are the major factor.

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[8] The Allenstown Dam and Reservoir project was authorized by the Senate Public Works Committee's resolution dated April 9, 1964 as part of the Merrimack River Basin Study.

[9] "Preliminary Real Estate Planning Report, Allenstown Dam and Reservoir Project," unpublished report to the Real Estate Branch, New England Division, Corps of Engineers, February, 1971.

[10] Ibid., p.4.

Table 1-3: NUMBER OF IMPROVEMENTS AT THE ALLENSTOWN DAM AND RESERVOIR SITE, N.H., 1947 AND 1971

	1947	1971
Farms	33	9
Residences	24	80
Subsistence Homesteads	10	34
Commercial Establishments	6	18
Others	8	10
Trailer Sites	-	73

1.4 THE EFFECT OF THE EXISTING LAND MARKET ON RESERVOIR SITE PRESERVATION

The above examples illustrate, in part, why the operating market mechanism for land is not ideal in terms of reservoir site preservation. As evidenced in the examples then a first reason for site acquisition or methods of preservation is that durable facilities may otherwise be constructed on the site without due regard to a shortened life when the site is converted. This condition may result from ignorance of plans to develop a site or from a failure to impose the costs of shortened lives of capital on those making the decision to locate it there. An alternative undesirable outcome is that such facilities may be preserved by sacrificing the site, even though it is more valuable for reservoir purposes.

A second reason is that the market price of land may be bid up in anticipation of purchase for a reservoir site. Such a bidding-up process is very likely to occur once plans for a reservoir become rather firm. From a legal, administrative, and political standpoint, the land may be difficult or impossible to assess and acquire subsequently by condemnation at a price that excludes these speculative elements and, therefore is lower than the going market price. Even though under condemnation the court is not permitted to grant a price reflecting the public purpose to which the land will be put, experience indicates that compensation does often reflect speculative elements resulting from the proposed public use.

Thirdly, political pressures sometimes express values the market does not reflect adequately in individual property values. For example, the inundation of an entire community impinges upon social relationships and institutions that a piece-by-piece consideration of property values does not encompass. Churches, schools, cemeteries, cultural opportunities, and access to the homes of friends assume a value not

completely registered by market prices established when individual properties are sold. Many residents, for example, receive a surplus return from their property investment that cannot be compensated for by paying the going market price for their property. This is probably the major factor in the strong resistance that often exists in regard to property condemnation, especially in densely occupied areas. Similar 'external effects' tend to exist in regard to industrial and commercial activities (i.e., transportation services, face-to-face contact to conduct business, etc.), but these effects do tend to be reflected in property values to a greater extent. Furthermore, there are disadvantages (costs) imposed upon an individual or business when condemnation causes forced sale. The many inconveniences and disruptions forced sale can cause are obvious.

1.5 THE NEED FOR RESERVOIR SITE PRESERVATION IN NEW ENGLAND

Specifically, this report addresses itself to the need for advance land acquisition or preservation of reservoir sites for water resource projects in New England. But although the problems of suburban encroachment encountered in New England are common to the rest of the country,[1] there are some special circumstances that make advance acquisition in rural New England especially urgent.

In the rural areas of New England, leisure home developments and the rapid growth of winter recreational pursuits will

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[1] See Olsen, op, cit., pp. 6-9, for a review of problems in other parts of the country.

exert a major influence on land use. This is particularly true of Vermont, Maine and New Hampshire, all possessing many areas of ski resort potential in winter as well as being very popular for summer leisure home locations. There has been an obvious transition in the highest use of the land from agriculture to leisure homes in the vicinity of the developing ski resorts, a transition that has had a marked impact on potential reservoir sites, as illustrated by the examples of Section 1.3. Thus, many sites once identified as being suitable for water resource projects, and found to be economically feasible on the basis of the low real estate acquisition costs characteristic of predominantly agricultural or undeveloped areas, would today incur the large acquisition costs of residential homes.

The situation is complicated by the pecularities of the fragmented local government structure. New England, characterized by strong town and weak county governments, has a long tradition of community cohesiveness and autonomy in local government decision-making. The emphasis upon the town and the pride in home rule present a stumbling block to those regional, state and Federal agencies desirous of reserving land for future reservoir sites. This New England characteristic aggravates the urban-rural conflicts that underlie many of the difficulties experienced in implementing advance acquisition programs.[2]

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[2] The case studies in Rhode Island, presented in Chapter 7, will illustrate these difficulties in some detail.

In recognition of these specific New England traits as well as those characteristics inherent in any section of the country, the Corps of Engineers have long been concerned with the problems of advance acquisition, having seen numerous potential reservoir sites lost or in serious jeopardy as a result of the pressures outlined previously. For example, in the case of the Hodges Village Reservoir in the Massachusetts portion of the Thames River Basin, it is reported that one hundred homes were built in the reservoir area between first authorization of the site in 1941 and final project authorization in 1962,[3] resulting in a five-fold escalation of land acquisition costs. Foster[4] reports that the Board of Engineers for Rivers and Harbors has now come to include an almost standard comment in many of its project reviews urging study and advance acquisition of lands immediately after project authorization.

In addition to the Corps of Engineers, many other agencies have underscored the importance of advance site acquisition. The Connecticut River Basin Coordinating Committee, with reference to the 1980 Early Action Plan,[5] recommended to Congress that:

> . . . Reservoir sites which might reasonably be foreseen to be utilized under existing or planned programs should be purchased as soon as possible. Emphasis should be given to multi-purpose sites.[6]

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[3] Olsen, G.T., op. cit.

[4] Foster, C., "Site Preservation in New England," unpublished study by the Harvard Forest, Petersham, Massachusetts, June 1970.

[5] "Comprehensive Water and Related Land Resources Investigation, Connecticut River Basin," Vol. I, Main Report, 1970.

[6] Ibid., p. xi-4.

As part of its long-range program for 2020,

> State agencies (should) acquire the land at 63 upstream sites at which they have already indicated an interest. In addition, 160 other site possibilities should be considered for preservation, either through purchase, zoning, or other means.[7]

A subsequent report on the Connecticut River Basin by the New England River Basins Commission [8] proposed to set aside $30 million for reservoir site acquisition.

> Recommendation: preservation and controlled use of proposed sites of large flood control and multiple purpose reservoirs and Public Law 566 small watershed impoundments included within the scope of the supplemental study program, with provision for interim outdoor recreational use pending commitments on development and for permanent outdoor recreational use in the case of sites abandoned for reservoir use.
>
> Objective: to preserve options for appropriate use of unique natural environments pending commitments on reservoir development or alternative uses.[9]

The Water Resources Board in Rhode Island, recognizing the serious problems of providing a site with adequate and

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[7] Ibid., p. xi-9.

[8] "The New England River Basins Commission 1980 Connecticut River Basin Plan," Boston, Massachusetts, January, 1972.

[9] Ibid., p. S-2.

high quality water, has declared advance land acquisition to be one of its basic guiding policies:[10]

> To provide for the acquisition and holding of sites for storage reservoirs for future use where the need for the construction of such reservoirs for water resource needs is demonstrated.[11]

In Massachusetts, the Water Resources Commission recently obtained legislation authorizing the expenditure of $5 million for the preservation of reservoir sites,[12] this being landmark legislation in that it did not relate to any particular site.

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[10] Statement of Policy, Water Resources Board of Rhode Island, April 9, 1968.

[11] Ibid., p. 3.

[12] Acts 1970, Chapter 767. This legislation is discussed in further detail in Section 3.2.

CHAPTER 2

METHODS FOR ADVANCE LAND ACQUISITION AND SITE PRESERVATION.

2.1 INTRODUCTION.

The purpose of this Chapter is to introduce the reader to the various techniques available for advance land acquisition and site preservation for water resource projects. The detailed analyses of Chapters 3,4, and 5 (Legal, Economic and Sociological Analyses, respectively), will presuppose familiarity with the basic concepts and techniques that are introduced in Chapter 2.

A comparative analysis of these various tools, from the perspective of their suitability to various situations likely to be encountered in planning for water resources projects, is deferred to Section 6.5, after the legal, economic and institutional problems have been examined more closely.

2.2 ACQUISITION OF FEE.

Acquisition of the fee simple[1] is the purchase of full title to property and all rights connected with it. Acquisition of fee by the jurisdiction sponsoring the water resources project is probably the simplest method of site preservation, and is backed by the power of eminent domain if the property cannot be bought by free negotiation in the market place.

The power of eminent domain can be vested in various levels of government, state, Federal and municipal, and is derived from the inherent attributes of a sovereign state. In most cases, state agencies, or municipalities wishing to exercise eminent domain outside their boundaries (as occurs in many municipalities acquiring lands for water supply purposes), must be given this power by authorization or enabling legislation from the state legislature. As we shall see in Chapter 3, the procedures involved vary from state to state.

There are important constitutional provisions that limit the exercise of the power of eminent domain.[2] They condemn

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[1]The terms "fee," "fee simple" and "fee absolute" are synonymous. For a full discussion of the exercise or purchase of full property rights, see, among others, Hebard, E. and Meisel, G., Principles of Real Estate Law, Simons-Boardman Publishing Corporation, New York, 1964, Chapters 2 and 3.

[2]See, among others, Roby, H., "Police Power in Aid of Condemnation," The Appraisal Journal, October, 1967, p.507.

the use of this power to appropriate private property for private use, and they condemn the use of this power to appropriate private property for public use without the payment of just compensation. The Fifth Amendment to the United States Constitution is a typical provision. It provides, "nor shall private property be taken for public use without just compensation." This limitation only restricts the powers of the Federal government. It does not limit the power of the states; they are sovereign in their own right. However, the Fourteenth Amendment to the United States Constitution, which provides, "nor shall any State deprive any person of life, liberty, or property without due process of law," does operate as a limitation on the state's power. By "due process," the United States Supreme Court has said that it is meant in the Constitution that if property is to be taken, it must be appropriated for a public use and just compensation must be paid.

As noted by Eliot,[3] the list of uses accepted by the courts as being public purposes has grown over the years.

> What is or is not a public purpose has changed over the years. There is no doubt that provision of parks and recreational areas is a pub-

[3]Eliot, C.W., "Tools and Methods for the Preservation of Open Spaces," in Protection and Development for Recreational Resources, Report to the New England Regional Commission, November 1968.

> lic purpose. There are many other open space uses of land which are recognized public purposes, including national, state and town forests; cemeteries; wildlife sanctuaries; water supply protection; flood control and storm drainage; military reservations; airport and approach areas; wide highway rights of way and rest areas; historic sites; grounds of institutions -- universities, hospitals, agricultural experiment stations; etc. It is an expanding list.[4]

To what extent a future public purpose, as well as a present public purpose, is a valid basis for the exercise of the power of eminent domain again varies from state to state, and will be discussed in more detail in Chapter 3.[5]

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[4] Ibid., p. 53.

[5] There are also considerable variations in the mechanics of the taking under eminent domain, for example, relating to time of payment and time of possession relative to the institution of proceedings. For a full discussion see:

McGough, B.C., "Eminent Domain Practices: Their Effect on Acquisition," The Appraisal Journal, April 1965, pp. 203 - 210; or

Edons, D., "Eminent Domain, Equity and the Allocation of Resources, " Land Economics, 46, 3 (1970), p. 314.

2.3 PURCHASE OF PARTIAL RIGHTS.

Property is made up of a set of rights, and to maintain a piece of land in its existing state it is not necessary to purchase all these rights. Acquisition of less-than-fee rights to land is known as a right in land, and includes easements, restrictions, or development rights. Less-than-fee approaches are characterized by the attempt to merge both public and private interests to serve both; the land remains in private ownership, and generally remains in productive use.[1]

Typical present uses of easements in the water resources field include their use to prevent hindrances to water flow in flood plains; to protect a water supply; scenic easements to protect visual qualities of the landscape; or conservation easements to preserve open space.[2] Consequently, there appears to be no legal hindrance to extend a less-than-fee acquisition to a major program of preservation for reservoir sites. However, there is a major difference in that ultimately, when the project is built, full fee acquisition (of the remaining rights) will be necessary in most instances, although flowage easements are sometimes utilized as a permanent feature.[3]

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[1] For example, easements are much in favor by electric utilities for routing transmission lines: as suggested by the terminology, what is purchased is only right-of-way, and many other uses are compatible with this right-of-way.

[2] There is a large literature on conservation easements as a tool for open space preservation; see, for example, Eliot, op. cit., pp. 58-61; or Whyte, W., "Securing Open Space for Urban America - Conservation Easements," Urban Land Institute, Report #36, December 1959.

[3] See also Chapter 3.

What, in effect, would be required for reservoir site acquisition is the purchase of development rights. These would specify and limit the changes in buildings and land uses that property owners are allowed to undertake. Certain European countries, especially Great Britain, have some experience of such purchases, but the major difficulty is the determination of compensation for the development right.[4] In theory, the compensation is the difference in market value between its unrestricted use and its value subject to easement, the latter, however, being difficult to measure.

There is some debate as to the utility of easements in that they are often claimed to cost as much as the fee. While this may be true in areas under strong pressure to change to a higher, more intensive land use, this is not necessarily so of outlying rural areas not subject to these pressures.[5]

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[4]See Kneese, A., op. cit., p. 614; and Turvey, R., The Economics of Real Property, George Allen Unwin, London, 1957, pp. 135-136.

[5]See also Olson, G., op. cit., p. 45.

2.4 POLICE POWER METHODS.

The police power, like eminent domain, is an inherent attribute of a sovereign state, and delineates the state's authority to regulate property in a manner that promotes the public health, safety, morals or general welfare, and to prevent actions by private parties which have an adverse affect on these public purposes.

The distinction between use of the police power to regulate (without compensation), and the use of eminent domain to acquire (with compensation), is not as clear as would seem at first. Indeed, there has been much learned debate on the matter, which has been reviewed by Roby,[1] who concluded, inter alia:

> Generally the practice of using the police power to save on the future cost of condemnation has been rebuked by the courts. The use of the police power in aid of condemnation is not recognized in legal opinions as a valid public purpose and therefore is not a proper objective.[2] In City of Plainfield v. Borough of Middlesex,[3] the court said that no matter how desirable for public purposes the contemplated project may be, the state cannot use the police power to depreciate the value of property for the purpose of purchasing it at a lower price.[4]

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[1] Roby, op. cit.

[2] See Krasnowieki, J., and Paul, J., "The Preservation of Open Space in Metropolitan Areas," 110 U.Pa.L.Rev. 179, pp. 184-198 (1962).

[3] City of Plainfield v. Borough of Middlesex, 69 N.J. Super 136, 173 A. 2d 785 (1961).

[4] Roby, op. cit., p. 509.

Nevertheless, Roby also concluded that there were considerable differences between theory and practice:

> On a theoretical basis, the use of the police power to condemn is contrary to constitutional principles. On a practical basis, while the courts have not openly legitimatized the use of the police power in aid of condemnation, many practices have developed which permit the tandem use of these powers. [5]

This apparent discrepancy is of great importance to site preservation for water resources projects, and we shall return to this point in our conclusions of the detailed legal review of Chapter 3.

2.4.1 Zoning.

The most important tool that belongs to the police power category of land use controls is that of zoning. [6] As noted by Olsen, [7] provided that there is an overall plan for the

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[5] Roby, op. cit., p. 510.

[6] The legal history of zoning, concerning in particular its constitutionality, was long and complex. It was resolved finally by the Supreme Court in the classic case of Euclid v. Ambler Realty Co., 272 U.S. 365, 47 S.Ct. 114, 71 L.Ed. 303 (1926). Even though rudimentary ordinances regulating building height appeared in Boston and Los Angeles around 1909, and found to be constitutional by the Supreme Court; zoning controversies have continued. An excellent analysis is "Zoning Controversies in the Suburbs," Report by Raymond and May Associates to the National Commission on Urban Problems, Report #11, U.S. Government Printing Office, Washington, D.C., 1968.

[7] Olsen, op. cit., p.51.

development of an area, along with a comprehensive river basin plan, zoning has a rational relationship to the public health, safety and general welfare; consequently, it can and has been used as a tool in water resources planning, the foremost example of which is flood plain zoning. But this rationale can be extended to site preservation for water resources projects in general, and thus bears close examination within the scope of this study.

But, as noted by Boselman and Callies, [8] there are problems with the existing structure of zoning itself, with its emphasis on very local control of land use by a dizzying multiplicity of local jurisdictions. [9] While the Standard Act allowing zoning was a state enabling act, it was nonetheless an enabling act, directed at delegating land use control to the local level, and especially at the city level where the problems which called zoning into being first arose.[10] It has become increasingly apparent that the local zoning ordi-

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[8] Boselman, F., and Callies, D., "The Quiet Revolution in Land Use Control," Council on Environmental Quality, U.S. Government Printing Office, Washington, D.C., 1971.

[9] See also "Fragmentation in Land-Use Planning and Control," Report by Coke, J., and Gargan, J., to the National Commission on Urban Problems, Research Report #18, Washington, D.C., 1969. A survey in 1968 conducted by the National Commission on Urban Problems revealed 6,880 municipalities and 2,004 townships with zoning ordinances.

[10] The six New England states have the simplest local zoning systems in the United States, in that controls are only exercised by towns and cities. There is no county zoning, and, with the exception of northern Maine, there is no unincorporated territory.

nance, virtually the sole means of land use control in the United States for over half a century, has proved woefully inadequate to combat a host of problems of statewide and regional significance, to which problems of water resources planning must undoubtedly stand as a prime example.

In response to this realization, a number of states have in recent years adopted innovative legislation that moves in the direction of a shift from local to statewide controls. For example, Hawaii, Vermont and Maine have each adopted a statewide land regulatory system, but the techniques of land use control employed by each of the three are markedly different. Other states have not adopted statewide land use controls, but have provided land use controls for "critical areas" of each state's environment. Thus Wisconsin protects shorelands around lakes and along waterways, while Massachusetts and Connecticut have adopted laws to protect their wetlands, and California has created a special agency to deal with the problems of San Francisco Bay. This innovative legislation has been reviewed in a recent comprehensive study to the Council on Environmental Quality, to which the reader is referred for further details.[11] Much of this legislation is highly pertinent to the scope of this study, and will receive further attention in Chapter 3.

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[11] Boselman and Callies, op. cit., pp. 5-254.

2.4.2 Subdivision Regulation.

Subdivision regulation is a second police power tool that might be considered for site preservation purposes, and has been analyzed by Eliot[12] in terms of its suitability as a tool for open space preservation *per se*. It does not appear suitable as a tool for reservoir site preservation.

2.4.3 Official Map Methods.

The official map is a third use of the police power. Like the procedures under subdivision regulation, areas needed for streets and, in some cases, parks and open space, are shown on an official map and reserved for those uses against building and development by denial of building permits for construction.

However, there appears to be no precedent for extending the use of this tool to the preservation of sites for water resource projects, the principal difficulty being that the enabling legislation usually requires that the intended purchase be consummated within a reasonable time, usually within three to five years. Thus the extension to the much longer time periods involved in reservoir site preservation is problematical.[13]

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[12] Eliot, *op. cit.*, pp. 64-67.

[13] Olsen, *op. cit.*, p. 52.

2.4.4 Compensable Regulations.

A proposal by Krasnowiecki and Paul,[14] called compensable regulation, was designed to bridge the gap between the power of government to regulate without compensation and the power of eminent domain. Land subject to compensable regulations would be appraised at its value immediately prior to (and unaffected by) the adoption of the regulations, for the purpose of establishing an owner's guarantee. Property owners would be entitled to draw upon the owner's guarantee for compensation payable at the time of sale of the property equal to the amount, if any, by which the sale price of the property fell below the owner's guarantee. The amount of the owner's guarantee for each property would be reduced by each payment and would remain attached to the property as a guarantee for later purchases.

Although developed in the context of preserving open space, rather than in terms of only temporary preservation until the project is constructed, some investigators have felt that this approach has some potential as a tool for site preservation for water resources projects. For example, Kneese feels that compensable regulation may be the most suitable basic device for the preservation of reservoir sites to the extent that such preservation is deemed desirable, especially for sites that will not be needed for some years.[15] In particular, Kneese feels that compensable re-

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[14] Krasnowiecki, J., and Paul, J., op. cit.

[15] Kneese, op. cit., p. 613.

gulation ranks high in terms of economic efficiency because:

> ...it permits the individual landowner to retain control of his land and to put it to productive uses. Furthermore, it preserves his freedom to sell his land to the highest bidder and, therefore, is likely to lead to a more efficient allocation of land within the limits of the regulation (as opposed to acquisition of fee).[16]

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[16] Ibid., p. 614.

2.5 TAX POLICY INCENTIVES.

As noted in Chapter 1, encroachment of suburbia into previously undeveloped areas and real estate speculation on the urban-rural fringe are two major reasons for advance land acquisition or preservation of potential reservoir sites. In many areas, these two phenomena are closely linked to the decisions of farmland owners to abandon farming and sell their land to real estate developers. Indeed, the loss of farmland and the desirability of preserving open space zones in the vicinity of urban areas has become a major issue in itself. Even though preservation of potential reservoir sites is not the motivation for tax policies designed to counter this trend, a review of such policies is clearly appropriate to the development of a methodology for site preservation.

2.5.1 Differential Assessment.

In recent years a number of states have introduced legislation to provide real estate tax relief on farmland. It is said that, if owners of farmland near urban areas are to be

taxed on the price that their land will sell in the market place, they will be forced to sell their farm holdings because the agricultural income cannot support such taxes. In an area under pressure from developers, market value will reflect the potential use of the land for residential, commercial or industrial use, rather than for agricultural use. Furthermore, many have held that market value taxation is not only unfair to the farmer, but that maintaining farmland around growing cities serves a public purpose, and, therefore, should merit special tax consideration.[1]

Three general methods have been devised to help farm owners in this situation: preferential assessment, deferred taxation, and restrictive contracts and agreements. Differential assessment is sometimes used as a collective term for all three methods.

2.5.2 Preferential Assessment.

The simplest device is simply the assessment of farmland on the basis of its value in its present use, and that market values reflecting its potential uses, such as for housing subdivisons, or commercial developments, be ignored. Laws to permit this practice are on the statute books of several

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[1] House, P., "Partial Tax Exemption for Farmland Properties in the Urban-Rural Fringe," The Appraisal Journal, July 1966, p. 393.

states,[2] although the exact provisions vary from state to state. In particular, some states require that the land must have been in agricultural use for the two or three years preceding the tax year. For example, Massachusetts voters were asked in November 1972, for an opinion on a referendum that reads:

> Full power and authority are hereby given and granted to the general court to prescribe, for the purpose of developing and conserving agricultural or horticultural lands, that such lands shall be valued, for the purpose of taxation, according to their agricultural or horticultural uses; provided, however, that no parcel of land which is less than five acres in area or which has not been actively devoted to agricultural or horticultural uses for the two years preceding the tax year shall be valued at less than fair market value under this article.

This would become an amendment to the State Constitution, which presently reads that all property be assessed at its full market value, regardless of its present use.

On this constitutional basis of uniform full taxation and also uniform zoning, as it relates to zoning of such agricultural land, some questions have been raised as to the constitutionality of preferential assessment. Because of the question that exists, at least four states, including Massachusetts, as well as New

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[2] Alaska, Colorado, Connecticut, Delaware, Florida, Indiana, Iowa, Maryland and New Mexico. Detailed descriptions of these laws can be found in Hady, T.F., and Stinson, T.F., "Taxation of Farmland on the Rural-Urban Fringe: A Summary of State Legislative Activity," U.S. Department of Agriculture, Agricultural Economics, Report #119, 1967. A Constitutional amendment to permit preferential assessment was approved in New Hampshire in November 1968.

Hampshire, Maryland and New Jersey, have passed constitutional amendments to clarify the legality of this tax policy. Since there is precedent in these states, it would seem that if doubt existed, a similar amendment could be passed in other states.

Otherwise preferential assessment has been attacked on two grounds.[3] First, it has been argued that it places an additional real estate tax burden on other taxpayers, while obtaining no guarantee of compensating benefit for the public. And, second, it has been suggested that taxes may be avoided by minimal farming operations while waiting for an increase in land value.

2.5.3 Deferred Taxation.

In response to the objections raised against preferential assessment, several states have enacted deferred taxation laws.[4] Under deferred taxation laws, the local assessor determines two values for each parcel of farmland. The first value is based on the land's present agricultural use, and the value serves as the basis for current property taxation. The second is based on market value of the property; that is, its value in the absence of the deferred tax law. If the land is ever diverted to non-agricultural use, the additional taxes that would have been due had the property been taxed at market value rather than agricultural use value are collected for the most recent three or five years. The deferred tax acts as a lien on the property which becomes payable when the property is sold into another use.

Hady[5] describes several variations of the deferred taxation

[3] Hady, T.F., "Differential Assessment of Farmland on the Rural-Urban Fringe," p. 25.

[4] For details see Hady and Stinson, op.cit.; Rhode Island, New Jersey, Oregon, Texas and Minnesota have enacted such deferred taxation laws.

[5] Ibid., p. 26.

idea. One is that the state charge interest on the amount of taxes deferred. Another is the number of years the tax is deferred; this method is subject to the greatest variation. Some states have said that as few as three years real property tax deferral is sufficient; others have suggested seven years. Still other plans have suggested that there should be no limitation on the number of years. Another method, tried in some states, is that of tying the preferential assessment and tax deferral to planning and zoning, which requires that land be zoned for agricultural use or open space before it can receive preferential treatment. Finally, other plans require that the farm owner wait a specified period of time before he is able to sell his property out of the preferred use.

But deferred taxation has also been criticized on a number of counts. For example, House[6] cites the following objections:

> Administrators in the field of real property taxation point to the additional burden of double assessment, and the cost and inconvenience of keeping a double set of books on each property which is granted preferential treatment. The farm owner argues that the deferment is unfair in that after a number of years (in the case of a tax deferment which does not have a stipulated cut-off point), it becomes a deterrent to any sale of the property. The arguments also state that the tax erodes the farmer's capital which does become his retirement income. In the same vein, the farmer argues that if his widow is forced to sell the farm after his death, a policy of unlimited de-

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[6] House, op cit., pp. 405-406.

ferment will penalize the heirs unduly. Finally, the nonfarmer, who must pay increased real property taxes if others are granted preferential treatment, argues that provisions which defer real property taxes for only a few years are unrealistic and are little different from a policy of straight preferential assessment. Finally, the owners of farmland, land developers, and others in the states where there is some form of restriction on the number of years an owner must wait before he is able to sell his land to another use (ten years in California, for example) find the policy too restrictive and potentially unrealistic in the face of future demands for land.

2.5.4 Restrictive Contracts and Agreements.

As noted in Hady's detailed review, both preferential assessment and deferred taxation are deficient in that they leave the community with no choice. Any land that meets a minimal definition of agricultural use must be given the reduced assessment. Some of this land may be in areas that the citizenry has decided should go into urban use in the near future. If differential assessment laws have the effects often claimed for them, they will retard this conversion. This line of argument leads to the third approach, which is to make differential assessment part of the total planning and zoning program, not an independent policy that may produce effects contrary to local planning. Land in agricultural use zones is to be permitted the special treatment; land in other zones is not.[7] Laws incorporating this feature,

[7] Stocker, F.D., "Taxing Farmland in the Urban Fringe," J. Farm. Econ., 45, pp. 1131-1137, December 1963.

through contracts and agreements that restrict the use of the land, are now[8] on the statute books of California, Hawaii, and Pennsylvania.

2.5.5 Effectiveness of Differential Assessment in Preserving Open Space.

There is some debate as to whether the methods described in the previous section are as effective as their champions had hoped. A study of the results of the earliest legislation to allow differential assessment, passed in Maryland in 1965, showed largely inconclusive results in terms of the overall patterns of land-use development.[9]

Foster [10] has reviewed the experience of Connecticut, which enacted, in 1963, a measure for assessment in accordance with current, rather than potential, use.[11] But again, accurate

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[8] For example, the Hawaii law, passed in 1961, provides for a land owner to petition the State to have his land declared as dedicated to specific agricultural uses. If his petition is approved, the owner forfeits the right to change the use of his land for ten years, and the land is assessed on the basis of the permitted uses. The covenant is automatically extended each year, except that after the fifth year either the state or the land owner can give five years' notice of cancellation. If the owner does not observe the restrictions, the special tax assessment is cancelled, retroactive to the date of the petition, and the additional taxes that would have been due are collected, with interest. See Hady, op. cit., p. 26.

[9] House, op.cit., pp. 394-407.

[10] Foster, op. cit., pp. 57-58.

[11] P.L. 490.

statistics on actual accomplishments were insufficient to make a full evaluation.

The problems of taxing the present use of agricultural land, rather than its market value, are closely related to the problem of land versus real property taxation in urban areas, a problem that has been argued at length by urban economists for many years.[12] Again, lack of experience with the proposed alternatives has not yet allowed an objective evaluation.

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[12]See, among others, Smith, T.S., "Land Value Versus Real Property Taxation: A Case Study Comparison," Land Economics, XLVI (1970), 3, pp. 305-313; Thorndike, S.L., "Some Theoretical Aspects of Building Value Tax Burdens on Land Owners," Land Economics, XLVI (1970), 1, pp. 59-67; Gaffney, M., "Land Rent, Taxation and Public Policy," Papers of the Regional Science Association, XXIII (1969), pp. 141-153.

CHAPTER 3

LEGAL ANALYSIS

3.1 INTRODUCTION.[1]

Historically speaking, American water law began with the premise that men had common rights to common waters.

> As long ago as the Institutes of Justinian, running waters, like the air and the sea, were res communes -- things common to all and property of none. Such was the doctrine spread by civil law commentators and embodied in the Napoleonic Code and in Spanish law. This conception passed into the common law. From these sources, but largely from civil law sources, the inquisitive and powerful minds of Chancellor Kent and Mr. Justice Story drew in generating the basic doctrines of American water law.[2]

American water law had its origins on the east coast of the United States, an area with climatic similarities to the old world.[3] Hence the development of the riparian doctrines of water use, that is, land ownership included water rights to surface and groundwaters adjacent to and through the conveyed property.[4] Enough water flowed in the many streams and rivers of the humid east coast to supply colonial citizens, and to warrant no further extension of water law at this time. Natural flow and reasonable use theories grew as the usufructuary rights of land owners to their waters were abused, and

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[1] See Chapter 2 for definition of basic terminology.

[2] United States v. Gerlach Livestock Co., 339 U.S. 725, 744-745, 94 L. Ed. 1231, 70 Sup. Cit. 955, 20 ALR 2d 633 (1950).

[3] Clark, Waters and Water Rights, Vol. 1, s. 16, p.66.

[4] Ibid., s. 4.3., p.34.

riparians were prohibited any use of their water source that would cause material injury to those above or below on the stream.[5]

Access to common waters in New England considered the problem of common good versus individual rights. A Massachusetts Bay Colony Ordinance of 1649 decreed, with respect to any pond with a surface area in excess of ten acres:[6]

> And for great ponds lying in common though within the bounds of some town it shall be free for any man to fish and fowl there, and may pass and repass on foot through any man's property for that end, so they trespass not on any man's corn or meadow.

Maine[7] and New Hampshire[8] followed suit with minor differences. As a whole, the rest of the eastern states including Rhode Island, Vermont, and Connecticut came to recognize common water use in the light of individual right.

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[5] Ibid., s. 16.2, p.68.

[6] Massachusetts Bay Colony Ordinance, "Body of Liberties," amendment of 1649, as quoted in Slater v. Gunn, 170 Mass. 509, 49 NE 1017, 1019, 41 LRA 268, 273 (1898). See generally Smith, The Great Pond Ordinance -- Collectivism in Northern New England, 30 Boston U.L. Rev. 178 (1950); Annot., 57 ALR 2d 569, 583 (1958); Locke, Right of Access to Great Ponds by the Colonial Ordinance, 12 Maine L. Rev. 148 (1919).

[7] Barrows v. McDermott, 73 Maine 441 (1882); Brastow v. Rockport Ice Co., 77 Maine 100 (1885); Auburn v. Union Water Power Co., 90 Maine 576, 38 A 561, 38 LRA 188 (1897); Conant v. Jordan, 107 Maine 227, 77 A 938, 31 LRA (NS) 434 (1910), In re Opinion of the Justices, 118 Maine 503, 106 A 865 (1919).

[8] Percy Summer Club v. Astle, 163 Fed.1, 90 CCA 527 (CA-1 NH, 1908), 166 Fed. 1020 (1908); Concord Mfg. Co. v. Robertson, 66 NH 1, 25 A 718, 18 LRA 679 (1890); State v. Welch, 66 NH 178, 28 A 21 (1890); Percy Summer Club v. Welch, 66 NH 180, 28 A 22 (1890); Whitcher v. State, 87 NH 405, 81 A 549 (1935).

On the other hand, groundwater ownership extended ad coelum - ad inferos, up into the heavens and down into the earth. Land ownership included absolute ownership of groundwater.[9] An owner's use of groundwater on his own property was not restricted, even though it caused depletion of stream supply or groundwater of a neighbor's land.[10] Unless that neighbor could prove unreasonable use on the part of the owner or material injury to his own land, the case was damnum absque injuria,[11] that is, an injury "incidental to reasonable enjoyment of the common right can command no redress."[12]

Scarcity of water in the west on the American frontier caused settlers to abandon the riparian doctrine for one more suitable to an arid climate,[13] hence, the rise of the prior appropriation doctrine. According to this doctrine, water rights are based on priority of use rather than land ownership. Even during drought, water is available for domestic use and irrigation, whereas lesser needs must be forfeited. An appropriator may use a supply of water without regard to his location, and, since his rights are acquired only through use

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[9]Clark, op.cit., s. 17.1, p.71.

[10]Greenleaf v. Francis, 35 Mass (18 Pick.) 117 (1836); Roath V. Driscoll, 20 Conn. 533, 540 (1850).

[11]Clark, op.cit., s.4.1, p.30.

[12]Ibid., s.16.2, p.69.

[13]Ibid., s. 51.5, p.293.

of the water, they do not exist without that use. The amount of water used by each appropriator is legally determined as well as the order in which appropriators may use the water, hence the distinction between a senior and a junior water-rights holder.[14]

Public waters are determined according to the doctrines of east and west. In the western areas governed by the prior appropriation doctrine, any non-navigable waters not appropriated are properties of the state, free for use by the public, and subject to appropriation at any time.[15] Throughout the coterminous United States, regardless of water doctrine, navigability determines public use.[16] In some jurisdictions, states hold the title to beds of non-navigable waters.[17] Most

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[14] Ibid., s. 51.9, p.299.

[15] Act of March 3, 1877, ch. 107, s.1, 19 Stat. 377, 43 USC 321. The Supreme Court holds that this provision recognizes the state and local doctrine of appropriation but leaves it for each state to determine for itself the extent to which the rule of appropriation or the common-law rule in respect of riparian rights should obtain within its jurisdiction. California-Oregon Power Co. v. Beaver Portland Cement Co., 295 US 142, 163, 79 L. Ed. 1356, 55 Sup. Ct. 725 (1935).

[16] Clark, op.cit., s. 37.2, p.203.

[17] Stevens v. King, 76 Maine 197, 49 Am. Rep. 609 (1884) (ponds only, littoral owner owns to low-water mark); Paine v. Woods, 108 Mass. 160 (1871)(pond, littoral owner owns to low-water mark); State v. Gilmanton, 9 NH 461 (1838) (large lakes only).

states agree that tideland rights and rights to beds of navigable waters fall under sovereign rule, and are dedicated to public uses.[18] Yet a state may choose to give up this sovereign right, as some have, and extend riparian or littoral ownership to the bed of the stream or lake.[19]

Our concern for conservation of water resources is at first most directly related to these public waters, since public waters have been and will be the most accessible through state or municipal legislatures. In the 1890's, the era of traditional indiscriminate water use once curtailed, an era of conservation began with the passage of the timber withdrawal acts and similar legislations,[20] among them, plans for Massachusetts' Quabbin Reservoir, mentioned above. The change of temperament in the community of the United States from the 1890's only serves to clarify our need for further steps to-

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[18]Pollard v. Hagan, 44 US (3 How.) 212, 11 L. Ed. 565 (1845); Barney v. City of Keokuk, 94 US 324, 24 L. Ed. 224 (1876); Hardin v. Jordan, 40 US 371, 380, 35 L. Ed. 428, 11 Sup. Ct. 808, 838 (1891); Manchester v. Massachusetts, 139 US 240, 264, 35 L. Ed. 159, 11 Sup. Ct. 559 (1891); Shivley v. Bowlby, 152 US 1, 40, 57, 38 L. Ed. 331, 14 Sup. Ct. 548 (1894).

[19]For example: Shawmut Mfg. Co. v. Town of Benton, 123 Maine 121, 122 A 49 (1923); Brosnan v. Gage, 240 Mass 113, 133 NE 622 (1921).

[20]Forest Reservation Act of March 3, 1891, ch. 561, 26 Stat. 1095; Act of June 8, 1906, ch. 3060, 34 Stat. 225, 16 USC 431 (national monuments); Pickett Act of June 25, 1910, ch. 421, 36 Stat. 847, 43 USC 141, 142; Mineral Leasing Act of February 25, 1920, ch. 85, 41 Stat. 437, 30 USC 181 to 287 (applied to minerals and oil and gas); Taylor Grazing Act of June 28, 1934, ch. 865, 48 Stat. 1269, 43 USC 315 to 315n. Martz, Cases on Natural Resources, p.2 (1951).

ward conservation of water resources. The trend from an agricultural, mercantile society to an "urban, industrial, water-wasting, recreation-demanding community drawn closer each year by population growth and the fruits of science and technology"[21] has made water resource conservation with regard to future as well as present needs and considerations no less than compulsory. The New England area, so long accustomed to natural water abundance, must re-evaluate its condition of waning affluence toward sensible, responsible provisions for its future citizens.

All of the New England states are aware of the need for conservation and provide such for the present in many well-defined statutes. Since our main concern here is in holding land for future use, we shall examine the inadequate body of statutes and constitutional provisions related thereto, chiefly with respect to methods of acquisition. The purchase, lease, gift or otherwise of lands and/or waters to conserve water resources is universally provided for in these states. Any one of these methods, however, involves complications, restrictions, and obstacles detrimental to necessary rapid acquisition of clear title. Therefore, methods of unrestricted acquisition most inherent to sovereign powers shall be considered here: eminent domain, zoning, and conservation easements among them.

While more than one state or municipal agency has been granted the power of eminent domain, often for different but related purposes, it is expected that conflicts between le-

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[21] Clark, op.cit., p.4. See also Senate Committee Prints Nos. 14, 32.

vels may arise. Each state has provided settlement procedures for these cases.

Massachusetts settles the conflict of two agencies wanting to take the same land for different uses, or the taking of land already in public use, by legislative act.[22] In New Hampshire, when the Water Resources Board must take land already in public use, a commission appointed by the superior court must arbitrate the decision.[23] In Maine, a municipality may use any public places necessary in connection with the construction or maintenance of a water system.[24] Likewise in Connecticut, any municipality authorized to supply water may take needed lands and water,[25] while the State Water Resources Commission prepares a "statewide water resources plan" and coordinates regional water supply facilities.[26] On the other hand, the State of Vermont has vested its Water Resources Board with authority to approve plans for construction of any water supply facilities.[27] In Rhode Island, the State Water Resources Board again has almost exclusive authority over water uses, but a "State Properties Commission" regulates acquisition of land by State agencies.[28]

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[22] 79 MGLA 5.

[23] 481 NHRSA 11.

[24] 30 MRSA 4251:9.

[25] CGSA 25-42.

[26] CGSA 25-5b.

[27] 10VSA 25 Sec. 578.

[28] 37 RIGL 6-1.

3.2 MASSACHUSETTS.

3.2.1 Eminent Domain.

For the most part both Massachusetts and New Hampshire acquire land for conservation purposes by the power of eminent domain invested in state or municipal agencies. In Massachusetts the power of eminent domain for conservation or related purposes rests with all levels. Officials authorized to exercise eminent domain, where there are no other legal provisions, are: the Governor and council for the Commonwealth, the county commissioner for a county, aldermen for a city, selectmen for a town, a prudential committee for a district, the board of directors for a private corporation.[1] The General Court, by a constitutional amendment,[2] has the power to take property for the conservation of water and other natural resources. As a state agency whose jurisdiction is thirty-six cities and towns comprising metropolitan Boston, the Metropolitan District Commission (MDC)[3] may take any lands, easements or other interests necessary for the construction and maintenance of a metropolitan water works system,[4] for reservations,[5] or for boulevards.[6] The MDC, however, must have majority agreement of the Commission as well as of the board of park

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[1] 79 Massachusetts General Laws Annotated (MGLA) 2, (1920).

[2] Massachusetts Constitution, Art. 49.

[3] 92 MGLA 33.

[4] 92 MGLA 78.

[5] 92 MGLA 79.

[6] 92 MGLA 80.

commissioners of the town where the land is located.[7]

The head of another state agency, the Commissioner of Natural Resources, may exercise eminent domain for a purpose related to our topic: he may acquire lands suitable for state forests and for the production of timber[8] only with the approval of the Governor and council. More specifically, he may so acquire any lands outside of MDC jurisdiction for conservation purposes.[9] Again, however, his decision to exercise eminent domain is subject to the approval of the Governor and council, the Board of Natural Resources, and the town in which the land is located.[10] The Commissioner may also take to protect inland wetlands pending certain statutory conditions.[11]

Within the Massachusetts Department of Natural Resources, the duties of the Water Resources Commission include consultation on matters concerning water resources conservation and flood prevention, and it may negotiate such terms of land acquisition with any property owner that may be necessary to fulfill its duties.[12] Most importantly it may exercise its power of eminent domain to protect and conserve water impound-

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[7] 92 MGLA 79.

[8] 132 MGLA 33.

[9] 132A MGLA 3.

[10] 132A MGLA 3A.

[11] 131 MGLA 40A.

[12] 21 MGLA 9.

ment sites for the future water resource needs of the Commonwealth.[13]

On the county level, similar powers are provided. A county commissioner may acquire any open spaces by eminent domain for protection or limitation of future use[14] with the approval of the Board of Natural Resources.

Finally, on the municipal level, every city or town has the power to create within its legislature a Conservation Commission. The Conservation Commission may request that the municipality exercise its power of eminent domain to protect, conserve or limit the future use of open-spaced land and water areas. This action may be taken upon a 2/3 vote of the local legislative body.[15]

Also on the local level, a municipality's board of water commissioners may exercise eminent domain for the purposes of establishing a public water supply.[16] Emergency water supply conditions allow acquisition of waters and land by eminent domain on county and municipal levels, that is, with the sanction of the department of public health.[17]

Massachusetts also has an interagency "Lands Committee", similar to one established in Vermont, which guides the use of several land acquisition funds. The "Self-help Fund" available to towns for acquisition of land and water areas is one of the more pertinent State programs.

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[13] 21 MGLA 9A.

[14] 34 MGLA 25.

[15] 40 MGLA 8C.

[16] 40 MGLA 39B.

[17] 40 MGLA 40.

Chap. 767. AN ACT AUTHORIZING THE WATER RESOURCES COMMISSION TO ACQUIRE WATER IMPOUNDMENT SITES TO MEET THE FUTURE WATER RESOURCE NEEDS OF THE COMMONWEALTH.

Be it enacted, etc., as follows:

SECTION 1. Chapter 21 of the General Laws is hereby amended by inserting after section 9 the following section: —

Section 9A. The commission may acquire by purchase, gift, lease, eminent domain, or otherwise lands and waters and easements therein to protect and conserve water impoundment sites and land adjacent to such sites which it deems necessary to meet the future water resource needs of the commonwealth for flood control, low flow augmentation, and municipal water supply, provided that the exercise of the power of eminent domain shall be subject to the approval of the governor, the board of selectmen in a town or the city council in a city in which the land is located. If such board or council fails to approve or disapprove such proposed taking within ninety days after receipt of written notice of the proposed taking from the commission, such board or council shall be deemed to have approved the same. No subsequent transfer or sale of such lands or waters by the commission to any agency of the commonwealth or to any city, town, or district shall be made and no construction or water resources improvement thereon shall be undertaken without the approval of the general court. The commission may enter into an agreement for the temporary supervision and maintenance of such lands and waters with any appropriate public agency, and may permit temporary compatible private uses subject to such conditions as it may impose. Said lands shall be subject to payments in lieu of taxes as provided in sections thirteen to seventeen, inclusive, of chapter fifty-eight. The division of water resources and its duly authorized agents, without being liable for trespass, shall have the right after giving due notice, accompanied by a detailed plan to enter upon any lands for the purpose of making surveys, test pits, borings and geologic investigation. Any damages to property resulting by the exercise of the aforementioned rights shall be reimbursed by the commission to the owner of the property so damaged.

SECTION 2. The water resources commission is hereby authorized to expend a sum not to exceed five million dollars for the acquisition of land and waters as authorized by section nine A of chapter twenty-one of the General Laws, including not more than five hundred thousand dollars for expenses in connection therewith, including the cost of planning therefor and geological, hydrological and other studies. The commission may enter into contracts with agencies of the United States to obtain federal grants or reimbursements under related federal programs.

Figure 3-1: Chapter 767, Acts 1970, Sections 1 and 2 (Amendment 21 MGLAG).

3.2.2 Zoning, Conservation Easements and Land Use Control.

Massachusetts specifically enables any municipality except Boston to zone for the health, safety, convenience, morals and welfare of its inhabitants.[18] By a zoning ordinance, the cities and towns may restrict size and location of buildings, lots, open spaces, and use of land, including restricting residential areas from land subject to seasonal or periodic flooding. This act has been interpreted to include protection of a town's natural resources along coastal areas.[19] Among other purposes, zoning regulations are designed to promote adequate provision of water, and to preserve land amenities.[20] As an example, the Town of Amherst has included land use restriction for conservancy and watershed protection in its zoning by-laws. Tables 3-1 and 3-2, which have been extracted from the Amherst zoning by-laws, serve to explain the Conservancy and Watershed Protection Districts.[21] Municipalities are encouraged to join together into regional planning districts to promote the development of their areas for the general welfare of citizens.[22] The MDC is charged with regulating the size of certain open spaces near water sources, as long as it does not limit a town's rights to wa-

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[18] 40A MGLA 2.

[19] Golden v. Board of Selectmen of Falmouth, 1970 Mass. Adv. Sh. 1685, 265 NE 2d 173 (1970).

[20] 40A MGLA 3.

[21] Zoning by-law, Amherst, Massachusetts, amended through October 4, 1971.

[22] 40B MGLA 2.

TABLE 1. LAND USE

Principal Use - as defined in Section IV	Zoning Districts**									
	R-O	R-N	R-G	CR	R-F*	B-G	B-L* B-VC*	COM	LI	CWP*
1. EXTENSIVE USES										
a. Forestry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
b. Agriculture	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
c. Greenhouse or farm stand	Yes	No	No	No	No	No	No	Yes	Yes	Sp
d. Commercial animals	Yes	No	No	No	No	No	No	No	Sp	Sp
e. Authorized earth removal	Sp	Sp	Sp	Sp	Sp	Sp	Sp	Sp	Sp	Sp
f. Processing earth products	Sp	Sp	No	No	No	No	No	No	Sp	Sp
g. Conservation use	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
h. Organized recreation	Sp	Sp	Sp	Sp	Yes	Yes	Yes	Sp	Sp	Yes
i. Commercial sport grounds	Sp	Sp	No	No	No	No	No	No	Sp	Sp
2. RESIDENTIAL USES										
a. One-family dwelling	Yes	Yes	Yes	Yes	Sp	No	No	No	No	No
b. Apartment or row house	No	No	Sp	Sp	No	Sp	Sp	No	No	No
c. Converted dwelling	No	Yes	Yes	Yes	No	Sp	Sp	No	No	No
d. Combined business-residence	No	No	No	No	No	Sp	Sp	No	No	No
e. Fraternity or dormitory	No	No	No	Sp	Yes	No	No	No	No	No
f. Hotel or motel *	No	No	No	Sp	No	Sp	Sp	Sp	Sp	No
g. Planned unit residential development	Sp	Sp	Sp	No	No	No	No	No	No	No
3. INSTITUTIONAL USES										
a. Educational institution	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Sp
b. Nursery or kindergarten	Sp	Sp	Sp	Sp	No	No	No	No	No	No
c. Trade or business school	No	No	Sp	Sp	No	Yes	Yes	Yes	No	No
d. Church or convent	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
e. Library or museum	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Sp
f. Public recreation use	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
g. Hospital or nursing home	Sp	Sp	Sp	Sp	No	Sp	Sp	No	No	No
h. Cemetery	Sp	Sp	No	No	No	No	No	No	No	No
i. Lodge or club	Sp	Sp	Sp	Sp	Sp	Yes	Yes	No	No	No
j. College service facility	Sp	Sp	Sp	Sp	Sp	Yes	Sp	Yes	Yes	No
4. GOVERNMENTAL AND PUBLIC SERVICE										
a Public utility *	Sp	Sp	Sp	Sp	Sp	Yes	Sp	Yes	Yes	Sp
b. Airport or heliport	Sp	Sp	No	No	No	Sp	Sp	Sp	Sp	No
c. Governmental building	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Sp
d. Water supply use	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
e. Other governmental use	Sp	Sp	Sp	Sp	Sp	Sp	Sp	Yes	Sp	Sp
5. RETAIL BUSINESS AND SERVICE										
a. Retail store	No	No	No	No	No	Yes	Yes	Yes	No	No
b. Personal service shop	No	No	No	No	No	Yes	Yes	Yes	No	No
c. Restaurant	No	No	No	No	No	Sp	Sp	Yes	No	No
d. Drive-in	No	No	No	No	No	No	No	Sp	No	No
e. Indoor amusement	No	No	No	No	No	Yes	Sp	Yes	No	No
f. Undertaker	No	No	Sp	No	No	Yes	Sp	No	No	No
g. Appliance repair shop, studio	No	No	No	No	No	Yes	Yes	Yes	No	No
h. Building trade or repair shop	No	No	No	No	No	No	Sp	Yes	No	No
i. Veterinary or kennel	Sp	Sp	No	No	No	No	Sp	Yes	No	No
j. Financial or business office	No	No	No	No	No	Yes	Yes	Yes	No	No
k. Professional office	No	No	Sp	Sp	No	Yes	Yes	Yes	No	No
l. Medical laboratory	No	No	Sp	Sp	No	Yes	Yes	Yes	Yes	No
m. Auto service station	No	No	No	No	No	Sp	Sp	Sp	No	No
n. Salesroom for autos, boats, etc.	No	No	No	No	No	Yes	Sp	Yes	No	No
o. Parking facility	No	No	Sp	Sp	Sp	Sp	Sp	Sp	No	No
p. Outdoor amusement	No	No	No	No	No	No	No	Sp	No	Sp
q. Medical center	No	Sp	Sp	Sp	No	Yes	Yes	Yes	No	No
r. Auction gallery	No	No	No	No	No	No	Yes	Yes	Yes	No
6. COMMERCIAL AND INDUSTRIAL										
a. Warehouse	No	No	No	No	No	No	No	Yes	Yes	No
b. Storage yard, open-air sales	No	No	No	No	No	No	No	Sp	No	No
c. Manufacturing, packaging, processing or testing use	No	No	No	No	No	No	No	No	Yes	No
d. Repair garage	No	No	No	No	No	No	No	Yes	No	No

*Site plan approval required - see Section X-3

**For uses permitted in educational districts, see Section X-1, and for uses permitted as a special exception in residence districts under planned unit residential development - see Section X-6

Table 3-1: Amherst Zoning By-Law.

I. PURPOSE

This ZONING BY LAW is enacted pursuant to, and under the authority of, Chapter 40 A of the General Laws as amended, for the purpose of promoting the health, safety, convenience and general welfare of the inhabitants of the Town of Amherst.

II. ZONING DISTRICTS

1. The Town is hereby divided into the following classes of zoning districts:

Residence Districts:

R O	Outlying Residence
R N	Neighborhood Residence
R G	General Residence
CR	Campus Residence
R F	Fraternity Residence District

Business Districts:

B-G	General Business
B-L	Limited Business
B-VC	Village Center Business
COM	Commercial

Industrial Districts:

LI	Light Industrial

Educational Districts:

ED	Educational

Conservation Districts:

CWP	Conservancy and Watershed Protection

2. The location and boundaries of these districts shall be as shown on the "Zoning Map, Town of Amherst, Mass.", dated December 18, 1963, the original of which shall be on file in the office of the Town Clerk. Said Zoning Map, and such amendments thereto as shall be duly adopted, shall be considered an integral part of this By-Law.

3. For purposes of interpretation, it shall be assumed that:

a. Boundaries which appear to follow streets, railroads, or streams shall coincide with the center line thereof.

b. Boundaries which appear to follow public or institutional property lines shall coincide with such property lines.

c. Boundaries which appear to run parallel to the sidelines of streets or railroad right-of-way shall be considered to be parallel to and a multiple of 50 feet distant from such lines (as determined by scaling the map unless a different distance is specifically indicated) or in specific instances shall run parallel to said streets, railroads or streams at the exact distance indicated on the Zoning Map.

d. Where a district boundary shall include a numerical figure followed by the letters MSL, it is at that number of feet above mean sea level. The basic source for determining such a line shall be the U. S. Geological Survey or subsequent field surveys, based on U.S.G.S. bench marks, by Registered Land Surveyors or Professional Engineers.

III. USE REGULATIONS

In each zoning district, land, buildings, and other structures may be used as a principal use only as set forth in Table 1 for the district in which located. In any district, a use which is identified with the word "Yes" shall be permitted as a matter of right (as shall appropriate accessory uses described in Section V). A use which is identified with the letters "SP" (together with any uses accessory thereto) shall be permitted as a principle use only on special exception granted by the Board of Appeals, as provided in Section XI, paragraph 4. A use which is denoted by the word "No" shall not be allowed as a principal use in that district. Uses listed in Table 1 correspond directly to the detailed descriptions of use set forth, and similarly identified by number and letter in Section IV.

IV. CLASSIFICATION OF USES

For the purposes of this By-Law, existing and future uses of land, buildings and other structures shall be allocated among the following categories. It is intended that every possible use be included in some category, and a use that does not readily fall into any category listed shall be included in the one to which it is most similar.

1. Extensive Uses of Land

a. Forestry and the harvesting of forest products.

b. Orchard, market garden, nursery, or other use of the land for commercial agricultural production.

c. Commercial greenhouse; salesroom or stand for the sale of nursery, garden or other agricultural produce (including articles of home manufacture from such produce), provided the major portion thereof shall be raised on the premises (or made from products so raised).

d. Commercial poultry or livestock farm, or the raising of pets for gainful purposes.

e. Removal of soil, loam, sand, gravel, rock, or other earth products are subject to the provisions of Section X, *Special Provisions*.

f. Processing of earth in connection with their authorized removal provided that such processing shall be clearly secondary to the removal and shall not involve the importation of significant quantities of materials from off the premises.

Table 3-2: Amherst Zoning By-Law.

ter supply.[23] The Commissioner of Natural Resources may regulate so as to protect inland wetlands[24] and to protect and conserve for water supplies those lands taken by him for state forests.[25]

In Massachusetts, the Conservation Commission of any municipality may acquire such conservation easements necessary to effect promotion, development, and protection of natural and watershed resources.[26]

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[23] 92 MGLA 33.

[24] 131 MGLA 40A.

[25] 132 MGLA 31.

[26] 40 MGLA 8C.

3.3 NEW HAMPSHIRE.

3.3.1 Eminent Domain.

New Hampshire has limited the power of eminent domain for conservation or related purposes considerably more than Massachusetts. Several departments are authorized to study municipal or statewide planning needs, among them the Regional Planning Commissions,[1] the Division of Public Health Services,[2] and the Northeastern Resources Commission,[3] but very few exercise eminent domain to solve these needs. Constitutionally, the state may not take a man's property without his consent or that of the body of the people.[4] Yet case law determines that, in the exercise of eminent domain, anticipated future use may be considered.[5]

The state agency responsible for state dams, reservoirs, and other water conservation projects is the Water Resources Board, the sole possessor of the power of eminent domain for these purposes on this level.[6] The Water Resources Board controls storage, conservation, and distribution of surplus

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[1] 36 New Hampshire Revised Statutes Annotated (NHRSA) 45.

[2] 148A NHRSA 1.

[3] 489A NHRSA 1.

[4] New Hampshire Constitution, Art. 12.

[5] Exeter Hampton Electric Co. v. Harding, 105 NH 317, 199 A 2d 298 (1964).

[6] 481 NHRSA 3.

waters,[7] and may exercise the power of eminent domain for the purpose of any project within its authority.[8] The power of the Water Resources Board also extends to acquiring lands and waters for dams in disrepair and channel improvement.[9]

On the local level, municipalities may condemn lands or waters for construction and maintenance of plants[10] for the manufacture and distribution of waters for domestic use,[11] as well as for the protection of its water supply.[12]

3.3.2 Zoning and Conservation Easements.

The use of zoning in New Hampshire is even more limited than in Massachusetts. New Hampshire extends its statutes to include a municipal zoning enabling act similar to that of Massachusetts: the legislative body of any city or town may zone to promote the health, safety, morals or the general welfare of its inhabitants. Municipalities are encouraged to restrict the use of land for trade, industry, residence or other purposes.[13] These regulations shall be made to follow a comprehensive plan designed to include adequate provision

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[7] 481 NHRSA 3III.

[8] 481 NHRSA 10.

[9] 482 NHRSA 35.

[10] 38 NHRSA 13.

[11] 38 NHRSA 3.

[12] 38 NHRSA 21.

[13] 31 NHRSA 60.

of water.[14] Most related to our purposes, these statutes apply to property zoned not only to present conditions, but also to the requirements of probable and desirable growth.[15] This without a doubt refers to requirements of future needs.

Also in New Hampshire, a municipal Conservation Commission may acquire conservation easement in land for conservation of natural and watershed resources.[16] Quite different from Massachusetts, however, these Conservation Commissions do not have the power to take by eminent domain.

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[14] 31 NHRSA 62.

[15] Kimball v. Blanchard, 90 NH 298, 7 A 2d 394 (1939); Edgewood Civic Club v. Blaisdell, 95 NH 244, 61 A 2d 517 (1948).

[16] 36A NHRSA 2.

3.4 MAINE

3.4.1 Eminent Domain.

Maine has limited the grant of power of eminent domain as has New Hampshire. Constitutionally, it is stated that private property shall not be taken unless required by the public.[1] The taking of waters to increase the value of privately owned water rights is, then, not for public use.[2] On the state level, the Public Utilities Commission must determine the necessity of an eminent domain taking by any water district.[3]

In Kennebunk, Kennebunkport and Wells Water District v. Maine Turnpike Authority,[4] it was determined that land needed for watershed control or water supply protection should be acquired by eminent domain.

On the municipal level, municipalities may exercise the right of eminent domain to acquire land or water rights for construction, operation, and maintenance of any revenue producing municipal facilities,[5] including water systems.[6] Also on the local level, any municipality may establish a

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[1] Maine Constitution, Art. 1, s.21.

[2] Opinion of Justices, 118 Maine 503, 106 A 865 (1919).

[3] 35 Maine Revised Statutes Annotated (MRSA) 3291.

[4] 147 Maine 149, 84 A 2d 433 (1951).

[5] 30 MRSA 4251:5.

[6] 30 MRSA 4251:1.

Conservation Commission, which has the authority to acquire land in the name of the municipality for the conservation of natural resources.[7]

More specifically, water companies may exercise the right of eminent domain to obtain sources of supply, locations for storage, distribution and protection of water supply.[8] Under this statute, Augusta Water District was permitted to condemn for water supply without geographical restrictions as long as it demonstrated necessity.[9] Further, any person, firm or corporation authorized to build and maintain dams for water storage reservoirs and basins may exercise the right of eminent domain only by authorization of legislative act.[10]

3.3.2 Zoning and Conservation Easements.

Maine, unlike either of the other two states, as if to balance the light weight given to eminent domain, rests the bulk of its public protection on the Maine Land Use Regulation Commission, that may zone for almost any purpose that can fall under its jurisdiction. In 1954, Maine first declared by statute its recognition of the need for soil and water conservation,[11] with the development of the Soil and

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[7] 30 MRSA 3851.

[8] 35 MRSA 3241.

[9] Augusta Water District v. White, 216 A 2d 661 (1966).

[10] 38 MRSA 993.

[11] 12 MRSA 2.

Water Conservation Districts. Not until 1969 was the Maine Land Use Regulation Commission (LURC) adopted,[12] and, with it, a declared need to zone to prevent despoliation, pollution and inappropriate use of water.[13] The LURC was charged to perform their duties in all unorganized and deorganized areas of the state to preserve public health, safety and general welfare.[14] Among its other duties is the protection of natural resources including flood plains, and the holding of reserve areas adjoining development districts for growth needed when the district becomes saturated.[15] Also the LURC shall maintain standards for use of water and land with respect to protection of water and other natural resources.[16]

Another department of the state, the Wetlands Control Board, once restricted to protecting coastal wetlands,[17] as of 1971 may zone for the protection and conservation of public or private water supplies.[18]

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[12] 12 MRSA 683.

[13] 12 MRSA 681.

[14] 12 MRSA 683.

[15] 12 MRSA 685A - 1.

[16] 12 MRSA 685A - 3.

[17] 12 MRSA 4701.

[18] 12 MRSA 4751.

On the local level, municipalities may adopt a comprehensive plan relative to past, present and future trends of water resources.[19] All zoning ordinances must be consistent with this comprehensive plan,[20] and shall be advisory with respect to the state.[21] However, lands in use or to be used by public service corporations may be exempted from zoning ordinances only by approval of the Public Utilities Commission.[22]

In Maine, the use of the conservation easement is similar to that of the other states. Municipal Conservation Commissions,[23] the LURC,[24] as well as any governmental body empowered to acquire interests in land[25] may benefit from the use of the conservation easement.

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[19] 30 MRSA 4961.

[20] 30 MRSA 4962A.

[21] 30 MRSA 4962E.

[22] 30 MRSA 4962C.

[23] 30 MRSA 3851.

[24] 12 MRSA 685-C4.

[25] 33 MRSA 667, 668.

3.5 RHODE ISLAND.

3.5.1 Eminent Domain.

Rhode Island has long been acutely aware of the development pressures on its water and related land resources due to the State's central position in the megalopolis. Since 1960 at least eleven bills and three major reports have been introduced or published which relate to reservoir site acquisition. One of the acts[1] which was finally passed and approved in the general election granted the Water Resources Board the power of eminent domain to acquire specific lands for the designated reservoirs. The property acquired is exempt from taxation except that payments are made by the State to the municipality in lieu of taxation.

In general the Rhode Island Water Resources Board is meant to provide the State "an active role in fostering and guiding the development of water resources." The Board is responsible for developing a comprehensive State water resources program, which includes a long-range plan for the State's water supply , and it may also acquire property to "implement the (State) land-use plan for resources and open space areas necessary to protect water sources." By statute the Board is to investigate groundwater supply areas and to formulate a plan for the protection and preservation of areas having a potential surplus supply. Such plans may either provide for long-term conservation and protection or temporary preservation prior to purchase.

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[1] H. 1624 - Chapter 133, Public Laws 1964, Amendment to Title 46, Chapter 15, Rhode Island General Laws (RIGL). The history of this legislation is discussed in detail in Section 7.8.

The act which created the Board grants almost exclusive authority over all water systems. Municipal or private water companies must limit developments to within their existing service areas. Approval of the Board is required for addition of new municipal sources of supply. However, the State did create a Kent County Water District[2] with broad powers to purchase land or, alternatively, to acquire private property through purchase of the company which is owner. Significantly the District may also hold land in conservation for public purposes.

According to an act passed in 1956, entitled "Acquisition of Land,"[3] the head of any State agency is authorized to acquire land or other property (water, buildings, etc.) for public use if necessary to a public work or improvement.[4] Power is only limited by the availability of appropriations and the review authority of the "State Properties Commission."[5] This unique Commission was established under the same act for the purpose of cooperating with other State agencies to regulate the acquisition, administration and disposal of land. Most condemnation proceedings involve the approval of the Commission and also the deposit therewith of payment for the

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[2] 39 RIGL 16-8.

[3] 37 RIGL 6, Amendment IX, Section 1, Constitution of Rhode Island.

[4] 37 RIGL 6-5.

[5] 37 RIGL 6-1.

land taken. Prior to disposition of the land for a public use the acquiring agency may rent the property, grant easements thereon or transfer it to another State department, under certificate by the Governor.

More specifically the State has passed an enabling act[6] providing cities and towns with the power of eminent domain for water supply purposes, upon the vote of its residents. The act also authorizes towns to enter into contracts for supply of water by a person or corporation to whom the condemnation may be ceded. However, corporations, including public or private municipal water companies, must obtain legislative authority to use the right of eminent domain.

3.5.2 Land Use Controls and Conservation Easements.

In the area of planning and development, Rhode Island has a Statewide Planning Program[7] designed to develop an official State map delineating areas for future public works in which there is State financial participation. This specifically includes water supply reservoirs. The State land-use map is referred to in many related statutes which call for conformance and integration so that there is general coordination among State and local agencies.

The same chapter also provides for a contrasting method of land and resource preservation, the use of taxing at a low

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[6] 39 RIGL 15: "Public Utilities and Carriers."

[7] Based on Chapter 44-27 of the General Laws.

"undeveloped" value. The law is directed at specifically encouraging the preservation of farm, forest and open space areas in their natural state. At the point at which the land is changed to a more intensive use, "roll-back" taxes may be collected for that year along with the two preceding years at the reassessed value. [8]

In another area, that relating to types of wetland and coastal resources, several protection laws [9] have been passed in Rhode Island. These are based on the local adoption and enforcement of land use and control measures to guide development. They are usually in the form of State enabling acts which authorize municipalities to adopt the police power to restrict use, amounting to a form of zoning. Specifically, the Coastal Resources Management Council is authorized to adopt regulations necessary to implement its resource management program. It is State policy to allow local authorities to make the initial decisions relating to lands within their boundaries. Such decisions may be reviewed by the Council, which may issue orders to violators.

Generally the State's police power to regulate land use is delegated to local governments through the zoning [10] and subdivision [11] enabling acts. Town zoning by-laws restrict the

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[8] 44 RIGL 27.

[9] 46 RIGL 11 and various other Chapters of Title 46.

[10] 45 RIGL 24.

[11] 45 RIGL 23.

location of buildings, and may specifically limit land use in areas subject to flooding. Proposed amendments would allow the municipalities themselves to promote the conservation of open space and natural resources and "to provide for the implementation of land use and development policies and patterns contained in the town plan" and in the State plan.

Local government may also authorize its planning commission to regulate the sub-division of land. One of the purposes of this action is "to secure sufficient areas in new developments for community facilities, to conserve . . . natural resources" and to ". . . facilitate provision of water supply . . . services."

3.5.3 Special Legislation for Advance Land Acquisition.

Since 1964 Rhode Island has developed a "Green Acres"[12] program to provide the State with lands for recreation and conservation purposes. The legislative act authorizes the State to:

> . . . acquire and to assist local governments to acquire substantial quantities of ... lands (for conservation of natural resources) now available so that they may be used and preserved for future use. . .

Acquisition may be by eminent domain but the law also allows the State to acquire development rights and easements for re-

[12] 32 RIGL 4-2: "Green Acres Land Acquisition."

creation or conservation. Similarly, a general law provides the State with acquisition rights for certain other types of land use, such as utilities, including water supply.

A law that is directly related to advanced land acquisition, but for industrial developments, is the "Rhode Island Land Development Corporation Act."[13] Passed in the 1970 legislative session, the law is now being considered by the courts for its legality.[14] The Act establishes an industrial "Land Bank" by which land is reserved for future industrial and commercial development. In this way economic expansion may be planned in an orderly, efficient and effective manner. Therefore such planning is easily integrated with the State land use plan , and projects may be undertaken only after consultation with the Department of Health regarding environmental factors. Likewise, potential water supply sites might be reserved in a Land Bank for future use, affording adequate time for the sites to be considered and investigated.

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[13] 37 RIGL 18.

[14] The Act was repealed in 1971.

3.6 VERMONT.

3.6.1 Eminent Domain.

Vermont has long been careful to preserve its valuable water resources. Its Water Resources Board[1] has traditionally been vested with an unusual degree of responsibility. In the area of land acquisition and resource conservation it makes regulations relating specifically to protection and preservation of water resources,[2] and generally has supervision thereof. For watershed protection and flood control programs, the Board is authorized to take land by eminent domain.[3]

Most significantly, however, Vermont's Water Resources Board provides technical assistance and administers State grants to municipalities for the development of water supplies and the construction of facilities for storage and distribution.[4] Each municipality with its own water supply must also file a copy of the maps and plans thereof with the Board which must approve all plans for the construction of such facilities.[5] Those towns seeking an assistance grant may be delegated the

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[1] 10 VSA 25 Sec. 573, Vermont Statutes Annotated (VSA)

[2] 10 VSA 25 Sec. 575.

[3] 10 VSA 27 Sec. 638-640.

[4] 10 VSA 25 Sec. 578.

[5] Ibid.

power of eminent domain but only for acquisition of distribution easement and not ". . . to acquire water supply sources or land for reservoirs."[6]

Nevertheless, another Vermont law specifically authorizes a municipality to "take, purchase or acquire" by eminent domain[7] the property and rights to a needed water supply site. This represents a relatively unique case where the condemnation power is broadly granted to local government rather than reserved to the State. This particular act also allows for supply contracts with public or private water companies,[8] but it is doubtful that the right of eminent domain could be transferred thereto.

Again at the local level, several towns may form a "Consolidated Water District"[9] by statute for the purpose of developing or acquiring water supplies and a water distribution system. Such District is formed upon the vote of the residents of each town and is headed by a Board of Water Commissioners. It has the right to hold or sell real estate for the use of the District and has the power of eminent domain as do municipal water systems.[10] However, in this case the Attorney General has indicated that there is no limitation on

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[6] 24 VSA 74A Sec. 3378 (1965, No. 149, Sec. 11).

[7] 24 VSA 73 Sec. 3301.

[8] 24 VSA 73 Sec. 3305.

[9] 24 VSA 74 Sec. 3341.

[10] 24 VSA 74 Sec. 3342.

the location of such real estate,[11] which gives the established District an unusually broad geographical scope.

3.6.2 Land Use Controls and Zoning

Several agencies and statutes exist in Vermont which are related to comprehensive planning of water and land resources and regulation of land use. The central planning office[12] has prepared a comprehensive State master plan which provides for preservation of scenic[13] and recreational[14] areas and State and local forests.[15] The "Vermont Development Department"[16] prepares studies on the State's population, existing land uses, public facilities and utilities within the framework of comprehensive state planning.

One broadly based agency is the "Natural Resources Interagency Committee"[17] which develops policies for the proper development, management and preservation of Vermont's environment, with particular emphasis on recreational facilities. Of interest to this study is the "outdoor recreation land and water conservation fund" administered by the Committee. The fund

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[11] 1964-66 Opinion Attorney General 280.

[12] Since 1971, this department's functions have been administered by the Governor's Office of State Planning and the Agency of Development and Community Affairs.

[13] 10 VSA 12 Sec. 264.

[14] 10 VSA 2.

[15] 10 VSA 55.

[16] 10 VSA 1 Sec. 5. Since 1969, the Agency of Development and Community Affairs.

[17] 10 VSA 2. Since 1969, abolished by incorporation into the Agency of Environmental Control.

is intended to enable Vermont to cooperate with the Federal government in programs relating to the "acquisition, planning and development of its outdoor recreation resources and facilities." The fund is to be financed by State appropriations and Federal grants and portions may be allotted to State resource agencies or to a municipality for recreation projects. Such a fund might be an ideal example of that which should be used for water supply site acquisition.

Other statutes such as the Soil Conservation Act[18] or Watershed and Flood Protection laws are based on the State's use of the police power to formulate (or delegate that power to formulate) ordinances governing proper use of the land.

Locally, this power is embodied in zoning by-laws or municipal plans. In a recent act entitled "Protection of Navigable Waters and Shorelands"[19] the State authorizes municipalities to adopt by-laws zoning all shore lands "for the efficient use, conservation, development and protection of the state's water resources." The Department of Water Resources will administer the act and adopt such laws for a town if it fails to do so. It will also prepare studies and a comprehensive plan for water resource conservation and coordinate related State activities.

General zoning authority may be granted to the municipal legislative body upon the vote of its constituents.[20] Such authority entails the power to make regulations and restric-

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[18] 10 VSA 21.

[19] 10 VSA 34.

[20] 24 VSA 67 Sec. 3002.

tions based on the zoning districts into which the municipality is divided. A Zoning Commission is appointed by the local governing body for this purpose of preparing a plan sub-dividing the town.

In the same context the municipality is authorized to set up a planning commission [21] which formulates a comprehensive plan for future development and recommends adoption of ordinances for sub-divisions and zoning. The municipal plan guides the construction of all facilities or works, including the water system, which are financed in part or wholly from public funds. These must either be in the plan or submitted for approval by the Commission.

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[21] 24 VSA 65.

3.7 CONNECTICUT.

3.7.1 Eminent Domain.

The State of Connecticut in 1960 was the fourth most densely populated in the nation and is still experiencing such great population gains that available land is rapidly diminishing. Thus, the problem of how one acquires the land and conserves it for future use or even present public use becomes critical.

The power to take land by eminent domain for a public purpose is vested in the State legislature but may be then delegated to a municipality, board, individual or corporation.[1] A determination of the necessity for condemning land for public use is usually also made by the legislature but it has the authority to transfer this power of determination to ". . . the persons or corporations to whom the power to condemn is given."[2]

General provisions enabling local governments to acquire land state that any incorporated municipality shall have the power to ". . . take, hold and condemn such real and personal

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[1] Connecticut General Statutes Annotated (CGSA), Constitutional Article 1, Section 11.
H.A. Bosworth and Son, Inc. v. Tamiola (1963), 190 A. 2d 506, 24 Conn. Sup. 328.

[2] Board of Water Com'rs of City of Norwich v. Johnson (1912), 84 A. 727, 86 Conn. 151, 41 L.R.A., N.S., 1024.

property as the purposes of the town may require."[3] Usually this procedure will be initiated if agreement on a sale price cannot be reached with the owner.[4]

Condemnation for specific purposes includes that in connection with Connecticut's system of natural area preserves.[5] By this Act the State Park and Forest Commission may take, by eminent domain, such lands as those which should be preserved in their natural condition and open spaces for recreation. The Commission may also grant licenses by which a portion of a state preserve may be used for an alternate public purpose. The alternate use would be allowed only upon a finding of public necessity and after approval by the Governor.[6]

The Commissioner of Agriculture[7] may also acquire property by eminent domain under the Watershed Soil Conservation and Flood Protection Programs.[8] Such property includes lands, easements or rights needed for various "works of improvement." Among these may be works for "any multiple purpose or open space use" or for "the conservation, development, utilization and disposal of water . . ."

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[3] CGSA 7-194.

[4] CGSA 48-6 (1961 P.A. 294).

[5] CGSA 23-52 (1969, P.A. 727, Sec. 1).

[6] CGSA 23-8,9, 11.

[7] Functions of the Department of Agriculture and Natural Resources, pertaining to water resources have been transferred to the Connecticut Department of Environmental Protection (1971).

[8] CGSA 25-106 to 109.

The State Water Resources Commission, besides studying general policy in regard to water needs, also promulgates regulations relative to flood control, rivers and harbors, and shoreland protection.[9] Again, for flood protection, the Commission may use the power of eminent domain to take land where it finds existing hazards to life and property. It also recommends such land use regulations as zoning of flood plains by municipalities and statewide actions by the legislature to protect water resources. Finally, the Commission is also authorized to coordinate regional water facilities plans and to prepare a "statewide water resources plan" which will identify available quantities and demand for water and will recommend optimum utilization and land use measures for water resources.[10]

At the local level, Connecticut law authorizes the creation of "municipal flood and erosion control boards" on a single or multi-unit basis.[11] These boards are equipped with the power of eminent domain allowing them to take land and preserve it for the purpose of controlling floods and soil erosion.

A municipality may also acquire open space areas, as identified on a state or local plan, by applying to the State Coun-

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[9]CGSA 25-3 to 25-8.

[10]CGSA 25-5b (1967, P.A. 477 Sec. 1-3; 1969, P.A. 628, Sec. 12).

[11]CGSA 25-86.

cil on Agriculture and Natural Resources for a grant-in-aid.[12] One of the purposes of this program is to conserve and limit the future use of open space.

With reference to local water supply facilities, Connecticut law authorizes municipal water works systems where there is no existing private system.[13] Cooperative "municipal water districts" are also encouraged in order to develop joint participation in broader based water supply.[14] And finally, metropolitan water districts are fostered by legislation which provides fewer limitations than for single-member systems and directly grants the power to acquire or condemn property.[15]

Specifically, however, any town or corporation authorized by law to supply water for public use may take and use land and water, but only as "... . the superior court . . . deems necessary."[16] In addition, land may be taken, with the same condition, for the purpose of preserving or protecting the

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[12] CGSA 7-131b.

[13] CGSA 7-102.

[14] Ibid.

[15] e.g., Gen'l Stat. (Supp. 1955), Sec. 347-353, as amended by Pub. Act No. 13, Sec. 36 (1957).

[16] CGSA 25-42.

purity of such water. These provisions usually apply to immediate use rather than to advance land acquisition although procedures are established for holding of property, pending condemnation proceedings.[17] To develop a supply outside of the authorized service area, the condemnation powers can be secured only through special legislative act.

3.7.2 Land Use Controls, Zoning and Planning.

In 1971 the Connecticut state legislature passed the "Inland Wetlands and Water Courses Act."[18] By this and other acts much of the duties and responsibilities of the Water Resources Commission were transferred to the Department of Environmental Protection (DEP).[19] Under the above-mentioned Act, the DEP is to develop comprehensive programs for the protection of wetlands and inland streams and to promulgate protective regulations. The Act also encourages municipal participation by means of protective regulations affecting their local activities and acquisition of wetlands and water courses, or easements thereto, etc. However, no mention is made of the use of eminent domain. The Department, in its general budget, was originally provided with $3.5 million for advance land acquisition but is still awaiting further legislative direction in terms of future takings. Whether this may be used for water supply sites is not known.

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[17] CGSA 48-16.

[18] Pub. Act No. 155, H. 5257.

[19] Pub. Act No. 872.

Municipalities, through the establishment of Conservation Commissions, may also provide for local conservation, supervision and regulation of the natural resources, including water resources, within their boundaries. Such Commissions may, with the approval of the municipal legislative body, acquire lands and easements in the name of the town.[20]

In 1963, Connecticut enacted a law[21] unique for its time, setting up a system of preferential taxation to encourage the retention of farmland, forestland and open space in private ownership. The Act provided for assessment in accord with current, not potential use and empowered the State to formulate guidelines for each such category of land. This type of system has been suggested elsewhere in this report to encourage preservation of reservoir sites, although Connecticut's law does not have rollback provisions to deter owners from speculation.[22]

In order to qualify for the above open space assessment, an area has to be first designated as such by a local planning commission. Municipal planning commissions and zoning commissions may be established according to the State enabling acts. By vote of its legislative body, any municipality may adopt and exercise zoning powers through a zoning commission,[23] which may regulate the location and use of structures and land for trade, industry or residence. Such regulations shall be "made in accordance with a comprehensive plan." Case law shows that this plan is not strictly binding, but only a general guide with which zoning regulations should be "in harmony."[24]

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[20] CGSA 7-131a.

[21] Connecticut Public Law 490 (1963).

[22] Site Preservation in New England, by Charles H.W. Foster, Harvard Forest Study, Petersham, Mass., June, 1970, pp.58-59.

[23] CGSA 8-1 et. seq.

[24] Pecora v. Zoning Comm. of Town of Trumbull (1958), 144 A. 2d 48, 145 Conn. 435; Woodford v. Zoning Comm. of Town of Ridgefield (.959), 156 A. 2d 470, 147 Conn. 30.

The municipal planning commission[25] is similarly authorized to prepare a "master plan of development." This would show the most desirable use of land for all purposes, the planned municipal improvements and the proposed sub-divisions of land, all designed to secure uniform and harmonious growth. On the other hand, the comprehensive zoning plan is concerned with controlling the use of property. Among the planning commission's powers are regulation of land sub-division and the power to review all municipal improvements, including the extent and location of public utilities for water.

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[25] CGSA 8-18 to 8-30.

3.8 FEDERAL LEGISLATION

The power of the Federal government in providing water and reservoirs, in relation to that of the states, is simply a matter of Federal rights versus states' rights, or individual rights versus the public good. We know by the Federal Constitution, under Act III, Section 2, that the United States Supreme Court has jurisdiction over controversy between two or more states, and we know by the case of Kansas v. Colorado[1] that this jurisdiction applies to use of interstate streams. We know by the Federal Constitution, under Article VI, Section 2, that all treaties are the supreme law of the land, and that the Federal government can agree by treaty on diversion of international rivers.

As between states, the Federal Constitution says that Congress has the power to regulate commerce among states. Thus the Federal government has had, and still has, control over "navigable" waters. Certain lands are held by private owners subject to dominant public rights, and when a legislature regulates such lands in order to preserve or promote those public rights, it is not bound to compensate their owners for resulting losses. A standard example of such a dominant public right is the Federal navigational servitude imposed on all lands under navigable waters of the United States.[2] The Federal government may, for

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[1] 206 U.S. 46.

[2] In United States v. Chicago, M., St. P. & P.R.R., 312 U.S. 592, 596-97 (1941), the Court said: "The dominant power of the Federal government, as has been repeatedly held, extends to the entire bed of a stream, which includes lands below high-water mark. The exercise of the power within these limits is not an invasion of any private property right in such lands for which the United States must make compensation....The damage sustained results not from a taking of the riparian owner's property in the stream bed, but from the lawful exercise of a power to which that property has always been subject."

example, prohibit any dredging, filling, or construction activity in navigable waters even though it thereby denies the owner of the beds of such waters all opportunity to obtain economic benefit from his property.[3]

In addition to the Federal navigational servitude, certain dominant public rights in navigable or tidal waters, often called public trust easements, may be enforceable against private owners in many states. In theory, the Federal navigational servitude is at least partly derived from these easements, and they are perhaps better established historically and analytically than the navigational servitude.[4,5]

In conclusion, the Federal government has superior jurisdiction over navigable waters, waters or area in controversy between two or more states, and in interstate waters.

Can the Federal government act within a state or states? Historically and presently, the Federal government has the supreme power of eminent domain. This power has been repeatedly tested by case after case, particularly in the area of taking land presently, for future use. In the determination of whether the taking of property is necessary for public use, not only present demands of the public, but those which may be fairly anticipated

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[3]Zabel v. Tabb, 430 F. 2d 199 (5th Cir. 1970).

[4]See Morreale, Federal Power in Western Waters: The Navigation Power and the Rule of No Compensation, 3 Nat. Res. J. 1, 25 (1963).

[5]Virginia Law Review, Vol. 58: 87.6, May, 1972.

in the future, may be considered.[6] Where a taking of land or water rights or other property is made for public use, there is not valid objection if a reasonable regard for probable future expansion is kept in mind and a taking of considerably greater extent than is required by present necessities is made, even if the parties making the taking derive a revenue from selling the surplus water or leaving the surplus land for private purposes until it is needed for public use.[7] One, however, who diverts water from a stream for domestic and irrigation purposes must, in order to protect his appropriation, use a reasonable degree of care to prevent loss by evaporation and seepage in conveying it to the place of use, since the law will not countenance a diversion of a volume many times greater than that which is actually consumed.[8]

It has been held that it is not necessary for a condemnor to use all previously condemned land before bringing proceedings to acquire additional land for future needs.[9]

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[6]Rindge Co. v. Los Angeles County, 262 U.S. 700, 67 L ed 1186, 43 S Ct. 689; Martin v. Portland Pipe Line Co. (CA1 Me) 158 F2d 848; Berry v. Alabama Power Co. 257 Ala 654, 60 So2d 681; State ex rel. Sharp v. 0.62033 Acres of Land, 49 Del 90, 110 A2d 1, affd (Sup) 49 Del, 174, 112 A2d 857; Carlor Co. v. Miami (Fla) 62 So2d 897, cert den 346 US 821, 98 L ed 347, 74 S Ct 37; Wampler v. Trustees of Indiana University, 241 Ind 449, 172 NE2d 67, 90 ALR2d 204; Pike County Board of Education v. Ford (Ky) 279 SW2d 245; Erwin v. Mississippi State Highway Com. 213 Miss 895, 58 So 2d 52; State ex rel. Hunter v. Superior Court for Snohomish County, 34 Wash 2d 214, 208 P2d 866 (fire station facilities for training firemen).

[7]Hendersonville Light & P. Co. v. Blue Ridge Interurban R. Co. 243 US 563, 61 L ed 900, 37 S Ct 440 (applying principle to sale of surplus hydroelectric power); Kaukauna Water Power Co. v. Green Bay & M. Canal Co. 142 US 254, 35 L ed 1004, 12 S Ct 173 (holding that so long as a dam was erected for a bona fide purpose of furnishing an adequate supply of water for a public use and was not a colorable device for creating water power, it was immaterial that there was a large surplus which might be retained within the immediate control of the state); Bell v. Mattoon Water works & Reservoir Co. 245 Ill 544, 92 NE 352; Pike County Board of Education v. Ford (Ky 279 SW2d 245.

The established power of the Federal government to provide water or other services for the public good by special Act of Congress is long established and Acts passed by Congress have been determined not to be in conflict with states' rights to act nor does any Federal Act prevent any state from acting in similar fashion.

The Act of Congress of September 19, 1890, the Reclamation Act of 1902, the Federal Power Act of 1920, the Flood Control Act of 1936, the Flood Control Act of 1944, the Water Pollution Act of 1948 (amended in 1956) have long been accepted, proving that water resources are not exclusively in the control of the states.

Today the power and control of the Federal government is as diverse and overlapping as is that of any New England state. The Hoover Commission report in 1955 lists twelve agencies responsible for flood control, nine for irrigation, seven for improvements to navigation, nine for pollution control, ten for watershed development, fifteen for power generation, and thirteen for water supply.[10]

The Army Corps of Engineers, under the Secretary of Defense, is principally concerned with navigation and flood control

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[8]Sterling v. Pawnee Ditch Extension Co., 42 Colo 421, 94 P 339.

[9]Berry v. Alabama Power Co. 257 Ala 654, 60 So2d 681, holding that it is not necessary for a power company to use up a right of way previously condemned before bringing proceedings to condemn an additional strip for future needs.

[10]Commission on Organization of the Executive Branch of Government, Water Resources and Power 13-15 (1955).

improvements, but has been authorized since 1944 to add power, irrigation, water supply and recreation features to its projects. The Bureau of Reclamation in the Department of the Interior has principal responsibility for irrigation programs, but since 1944 has been directed to add power, navigation, flood control and municipal water supply features to its projects. Today both agencies construct similar multi-purpose dams, but with quite different emphasis, policies and procedures. The Bureau of Reclamation, for example, must determine economic feasibility for its projects by obtaining reimbursement contracts for irrigation water supply and show a probable return of the capital allocated to power development and municipal supply. The Corps of Engineers, on the other hand, need demonstrate economic feasibility of its multi-purpose projects only to the extent that benefits equal or exceed costs, both tangible and intangible, but usually those that can be expressed in quantitative terms.

The Bureau of Reclamation does not need individualized congressional authorizations, but can proceed with construction on filing a report of economic feasibility with the President and Congress. The Corps of Engineers, however, needs specific authorization for each major project. A multi-purpose reclamation project will be administered to assure maximum water storage; a multi-purpose power project to maintain a steady and dependable stream flow throughout the year; a multi-purpose flood control project to reduce water in storage prior to maximum runoff periods.[11]

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[11] "Water for Mushrooming Populations," West Virginia Laws Review, December, 1959.

Since 1958, future municipal and industrial water requirements may be provided in reservoirs constructed by the Corps. However, State and local interests must agree to pay for the cost of such additional provisions.[12] The Secretary of Agriculture is authorized to advance up to thirty percent, but not in excess of $5,000,000,[13] of the total installation cost of any structure built for the purpose of including additional storage capacity to meet anticipated demands or needs for municipal or industrial water.[14] The advance must be repaid during the life of the project, but in no event exceeding fifty years from the time the reservoir is first used for the storage of water for water supply purposes, except that the cost of water supply storage for anticipated future demands need not be paid until such supply is first used.[15] The rate of interest will be determined by the Secretary of the Treasury under the provisions of section 8 of the act.[16]

Then, in 1965, the Northeastern United States Water Supply Act[17] (NEWS) declared that Congress recognized the metropolitan water supply problem to be "of such magnitude that the welfare and prosperity of this country require the Federal government to assist in the solution..." Therefore the Corps of Engineers is authorized to cooperate with Federal, State and local agencies in preparing plans to meet the long-range water needs of the northeastern United States. This plan may include provisions (and the Secretary of the Army is authorized) to construct,

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[12] Water Supply Act of 1958, 43 U.S.C. 390b.

[13] Act of August 7, 1956, ch. 1027, sec. 1(g), 70 Stat. 1090, 16 U.S.C. 1006a.

[14] Act of September 27, 1962, P.L. 87-703, sec. 104, 76 Stat. 109, 16 U.S.C. 1004 (2)(B); Watershed Protection Handbook, sec. 109.07.

[15] Ibid; Watershed Protection Handbook, sections 109.031, 109.08.

[16] Added by Act of August 7, 1956, op. cit., Watershed Protection Handbook, sec. 109.08, subsec. c.

[17] Public Law 89-298 (October 27, 1965) Title I, 89th Congress.

operate and maintain, by the United States, (1) a system of major reservoirs, (2) major water conveyance facilities and (3) major purification facilities. Such plans shall provide for appropriate State and local financial participation, and shall be considered a component of the comprehensive plan for the river basin.

Since the Corps, according to the NEWS and other Acts, is responsible for acquiring real property for dams and reservoirs, among other uses, it naturally comes under the jurisdiction of the Uniform Relocation Assistance and Property Acquisition Policies Act of 1970.[18] This act should alleviate some of the conflicts (and criticism of the Corps) which arise when landowners must be displaced. It eliminates many of the differences in relocation benefits from various Federal agencies and provides for more equitable treatment and broader financial assistance to all displaced residents. The Corps has also established guidelines for a relocation advisory service whenever a project may necessitate displacements.

Also in 1970 Congress set up a program to provide for the protection of wetlands. The Federal Water Bank Act [19] states: "The Congress finds that it is in the public interest to preserve, restore, and improve the wetlands of the Nation, and thereby to conserve surface waters,...to reduce runoff, soil and wind erosion, ...and to promote comprehensive and total water management planning....For the conservation of water on specified farm, ranch, or other wetlands identified in a conservation plan developed in cooperation with the Soil and Water Conservation District in which the lands are located, the term "wetlands" means the inland fresh areas..."

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[18] Public Law 91-646 (January 2, 1971) 84 Stat. 1894.
[19] U.S.C. sections 13-1-1311 (1970).

This program is analogous to the Agricultural Soil Bank Program.

In conclusion, there are many particular Acts of Congress establishing the authority of the Federal government, but many Acts have delegated limited authority to various agencies. Still, much can be done within the limits of an agency's powers and jurisdiction. So it is in New England, where, due to the nature of the area, State agencies may be constrained by indirect and non-legislative limitations on their actions. Yet the supreme authority remains with the highest legislative body, which for the country is the U.S. Congress.

CHAPTER 4

ECONOMIC ANALYSIS

4.1 INTRODUCTION

This chapter identifies the costs, transfers and benefits of reservoir site preservation policies. The analysis is framed in terms of outright advance aquisition of fee simple. Such modifications of the analysis as are necessary for some of the alternative preservation tools are discussed later in Chapter 6.

The decision rule to be used by public agencies in analysis of site preservation policies is essentially similar to the rules that apply to the private sector. But, because the development of such decision rules is quite technical, that analysis is presented in Appendix A. We have also attempted to use the four-account system as proposed by the U.S. Water Resources Council for the economic analysis of site preservation policies, an analysis that is presented in Appendix B.

4.2 LAND ACQUISITION BY PUBLIC AGENCIES

The public agency considering land acquisition is faced by essentially the same problem as the private firm, and will use essentially the same decision rule. The difference lies in the definition of costs and benefits. Items which the firm may not experience as costs are benefits to the society, and some items which the firm does count as benefits are often costs to the larger society.

An example of the former type is the cost of land. When the firm buys land, this is a definite cost. The deed that the firm receives in exchange for the money represents a claim on one particular and specific resource. In real terms, the cost of this resource to the firm is the value of the other resources the firm could have purchased with the money it spent on the land.

This is not true when society, acting through a government agency, purchases some land. Ideally, when the government purchases the land, it is transferring money from some of its members, the taxpayers, to another member, the original landowner. Society, as a whole, has neither gained nor lost any resources or claims over resources. It has no more and no fewer resources than it had before. Thus, the purchase is not a real cost to the society, but only a transfer of assets between its members.

Presumably, society gains no particular benefit solely from the simple fact that the public owns more land and one individual owns less land. Society's benefits result from the use it makes of that land. Society should only purchase the

land if these benefits exceed the purchase cost of the land (which is assumed to represent the land's value to the individual from whom it was purchased).

These benefits can fall into either of two general categories. The first category is a benefit which results in an increased availability of goods or services to society. Some of these goods or services (such as electricity) may be sold in the market, but for others (such as clean air) no market mechanism exists. There are accepted procedures for assigning monetary values to some of these non-marketed benefits (for instance, recreation); however, for others, such as the pleasure one gets from observing an attractive pastoral scene, there is no such procedure for quantitatively estimating their magnitude. The benefits in this first category may result from preventing the destruction of existing goods as well as stimulating the production of new goods. In either case, there would be more goods and services available to society with the proposed project than without it.

The second category of benefits does not result in the increased availability of goods or services, but nevertheless, as a result of some transaction, society considers itself to be better off. This type of benefit often occurs in the buying and selling of land. Since both the buyer and the seller are happy that the transaction has taken place, society (which, of course, includes the buyer and the seller) is better off.[1]

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[1] In terms of economic theory, the first category of benefits results from shifting the production possibility curve outward to a higher societal indifference curve, and the second results from shifting along a given production possibilities curve to a higher societal indifference curve.

The same distinctions can be made between different types of social and environmental costs. In the following three sections, we will first attempt to identify carefully the various types of benefits and costs which might be associated with the advanced acquisition of land for public projects. As in the case of the private firm, these benefits and costs can occur at different times:

> In the present (when the decision is made to purchase or not to purchase the land).
>
> In the interim period between the time the land would be purchased and the time when it would be used.
>
> In the future, at and beyond the time when the land would be used for the public project.

The occurrence of the benefits, costs and transfers that are discussed below are shown on Table 4-1. The bracketed number identifies the section in which the adjacent item is discussed.

Table 4-1: INCIDENCE OF COSTS, BENEFITS AND TRANSFERS

	PRESENT	INTERIM	FUTURE
BENEFITS	Anticipated appreciation in land values (4.3.1)	Interim land use (4.3.2)	Preventing uneconomic developments (4.3.3) Reduced transaction costs (4.3.4) Improvements in surrounding developments (4.3.5)
COSTS	Investment costs (4.4.1)	Non-project uses foregone (4.4.3) Management costs (4.4.2) Social costs of uncertainty (4.4.6) Differential loss of amenities and services (4.4.7) Non-maintenance of tenant-occupied structures (4.4.8) Planning inertia (4.4.4) Not building the project (4.4.5)	
TRANSFERS	Anticipated appreciation in land values (4.3.1 and 4.5.3) Investment costs (4.4.1)	Lost taxes (4.5.1) Planning blight (4.5.2) Land appreciation (4.5.3) General inflation (4.5.4) Speculation (4.5.5)	

4.3 BENEFITS

4.3.1 Anticipated Appreciation in Land Values[1]

One of the major benefits of advance land acquisition to the private firm is avoiding a substantial appreciation in land values.[2] To the extent that this saving results solely from a more accurate prediction of the future land market, this is not a benefit that can be claimed by a public agency. It is only a transfer from the individual who would be owning the land in the future to the public or society at large. Society is no better off in an efficiency sense, since one of its members is poorer and the rest are richer.

However, it is possible for the public agency and the land owner to have the same expectations on future land values, and yet for the land owner to be willing to sell to the public agency at what it considers an attractive price. The reason for this is that society may employ a different and lower discount rate than the private individual. With different discount rates, society and the individual can anticipate the same future price for the land, but the present value of that future price will be higher to society than to the individual. This is a real benefit to society, since no one is worse off, and all the taxpayers are better off. The amount of this benefit is the difference between the present value of the expected future price to society, and

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[1]See Donald C. Shoup, "Advance Acquisition by Local Governments: A Cost-Benefit Analysis," Yale Economic Essays, Fall, 1969, New Haven, Connecticut.

[2]See also Section 1.1.

what the public agency has to pay for the land in free negotiations.

There are two problems in estimating this benefit. The first is in distinguishing between the effects of differing expectations about future prices and differing discount rates. The amount attributable to different price expectations can be roughly estimated by assuming a discount rate for the private landowner and computing the present value of the land to him, ignoring any additional capital improvement, and using the same time period and expected future prices as has been used in computing the present value of the land to society. The difference between this imputed private present value and society's present value would approximate the net benefit resulting from the use of different rates.

A second problem is to choose an appropriate discount rate for society. This question has been dealt with theoretically at great length elsewhere.[3] At present, the Water Resources Council has a procedure which they use to determine the recommended rate for the evaluation of Federal water resource investment projects.

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[3]See, for example, 1) John V. Krutills and Otto Eckstein, "Multiple Purpose River Development," Baltimore, Maryland, Johns Hopkins Press, 1958; 2) Robert H. Haveman, "The Opportunity Cost of Displaced Private Spending and the Social Discount Rate," Water Resources Research, Vol. 5, n. 5 (October 1969), pp. 947-957; 3) U.S. Congress, Joint Economic Committee, "Economic Analysis of Public Investment Decisions: Interest Rate Policy and Discounting Analysis," Hearings held on July 30-August 1, 1968 (Washington, D.C., U.S.G.P.O., 1968); or 4) William J. Baumol, "On the Social Rate of Discount," American Economic Review, September 1968, pp. 788-802.

4.3.2 Interim Land-Use

Between the time the agency acquires the land and puts it to its final use, the land can be used for other purposes that provide social benefits. Both monetary and non-monetary social benefits may be derived from the land during this interim period. This land could be rented out or managed by the public agency for income-producing activities such as farming. The benefits of these activities would be measured by the gross income generated by the activity minus the sum of all costs (including the income to the entrepreneur managing the new activity). A simpler measure, if we assume that the market is operating reasonably well, is the maximum rental income that the public agency can receive for the land. Presumably, the interim use would not be one which required a large immobile investment, but this should certainly not be excluded if the user agrees to have the constructions demolished (to the extent required by the proposed project) before the public project is built.

Other uses of the land may also provide social benefits, but typically produce little or no financial income. For the most common such use, recreation, there are accepted procedures for estimating the equivalent monetary value.[4] Similarly, one can estimate the benefits resulting from the natural storage of flood waters along the stream, even though no market transaction takes place.

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[4] See Ad Hoc Water Resources Council, "Evaluation Standards for Primary Outdoor Recreation Benefits," Supplement No. 1 to "Policies, Standards, and Procedures in the Formulation, Evaluation and Review of Plans for Use and Development of Water and Related Land Resources," June 4, 1964.

There are other uses for which no such procedures have been proposed. One of these is the scenic benefit provided by open space. Another is that of providing habitat for wildlife.

4.3.3 Preventing Uneconomic Developments[5]

The primary justification usually proferred for advance land acquisition is that it will protect the land from uneconomic, immobile capital improvements. The private firm experiences equivalent benefits, but they are evaluated differently. For the firm, the benefits would be the increased amount that it would cost to purchase the land at the time of its expansion. For the public agency, it would be the economic value of the capital improvements on the land which would be destroyed by the public project plus any relocation costs.

Land best suited for a public project is more likely to be developed uneconomically than land best suited for private development. In a perfectly operating private market economy, the developer of the highest valued use would be willing to pay more for the land than a potential developer for any other, lower valued use. The price of the land will rise until only the highest valued user can afford to purchase and develop it. This is the way in which a perfectly operating land market (which also presumes no externalities) would tend to allocate

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[5]The use of the term "uneconomic" in this discussion does not imply that the alternate private use is not profitable in itself, but rather that it is not the most efficient use that could be made of the land.

land to its best uses. For a public use, however, a public agency finds it difficult to justify paying more for the land than it is worth in its next best alternate use. That is, the land owner cannot attempt to capture any of the producer's surplus associated with the highest valued use when that highest valued use is in the public domain.[6] Since the land speculator is unable to make any more by selling the land to the government than he would in selling it for the best private use, there is no incentive for him to save it for the public use. Thus, even if the public project is recognized to be the highest valued use, the system does not necessarily operate in such a way as to preserve the land for that purpose. This argues for more aggressive advance land acquisition for public projects.

As with the private firm, however, the benefit attributable to preventing uneconomic developments should be limited by the increased costs of moving to the best alternate site. These increased costs would include increased construction costs, increased operation and maintenance costs, increased costs for making the output available to the consumers (e.g., longer conduits, a pumping station for water supply, increased transportation costs to be experienced by potential recreationalists), and the value of the output which would have been provided by the best alternate site (e.g., reduced water supply, flood control, fewer recreation opportunities).

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[6] For further discussion on this point see, "Environmental Statement, Tellico Project," Vol. III, TVA Office of Health and Environmental Science, 1972 (Report TVA-OHES-EIS-72-1).

4.3.4 Reduced Transaction Costs

Typically, the earlier the land is acquired, the larger the average size a land parcel will be. The larger the average size of parcel, the lower the cost per acre of necessary surveying and legal fees. These are the transaction costs of buying property. Therefore, the earlier the land acquisition, the lower these monetary transaction costs are apt to be.

There may well be other non-monetary transaction costs associated with future acquisition as well. It is often necessary to take land through the process of eminent domain for public projects. The use of the eminent domain power implies that the public agency and the land owner cannot agree on an equitable price, resulting in the land owner being forced to sell his land for less than he would have been willing to accept in a free market transaction. He suffers a loss of consumer's surplus which, since he is a member of society, is a social cost as well. The magnitude of this cost is the difference between what he would be willing to sell the land for and the amount he is actually paid by the

public agency.[7] Since there is, of course, no way to estimate accurately what price a future land owner will want for his land, one can usually say no more than that such social transaction costs will be reduced to the extent that advance land acquisition is accomplished through free negotiations between the public agency and the land owner. To the extent that condemnation proceedings are used in advance land acquisition, these costs would also exist in the present.

Assuming that the land would normally be divided into smaller parcels over a period of time, the expectations would be that, since there will probably be more land owners in the future, there will be a higher probability of such social transaction costs occurring. Although these costs cannot be estimated in monetary terms, they are important -- as has often been demonstrated by the effort and expense that some land owners have been willing to incur in fighting eminent domain proceedings and public land acquisition.

4.3.5 Improvements in Surrounding Developments

The benefits and costs of public land acquisition accrue not only to the individuals on the land being acquired, but also to those surrounding this land. For instance, in the absence of a public project or advance land acquisition, the

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[7] Owners may also hold out for a higher price not because that is what the land is worth to them, but because they hope to capture some of the producer's surplus. In this case, the difference between their asking price and the final sale price does not represent a loss of consumer's surplus and should not be included in the calculations.

pattern of development of homes and shops might be as indicated in Figure 4-1 with the few shops in the project area and the homes on the outside. When the project is built, not only are the developments in the project area destroyed at some social cost, but the homes on the west now have no easy access to stores, and the shop on the east has lost its market. The nearest shopping facilities are now in the town, a fair distance on the opposite side of the reservoir area. In this case, after the project is built, the people in these homes would be experiencing significantly higher costs in getting to commercial areas and perhaps to their place of work. They well might not have located in this area if they had known that they would eventually have to experience these additional costs. The developments might have occurred more on the near side of the reservoir or closer to the dam site. In such a case, the additional costs that people surrounding the reservoir would have to incur after the project is built (that they would not have incurred had they been fully aware of the proposed project) could possibly be counted as benefits when an advance land acquisition takes place.

These costs are associated more with the degree to which the individuals are aware of the proposed project than with the fact of advance land acquisition. But they can be partially claimed as a benefit of advance land acquisition because this may be the most effective way to inform the public of anticipated developments. The advance land acquisition will not only prevent the developments in the project area around which the other developments grow, but should clearly indicate as well what public developments are proposed for the future, allowing the private sector to plan accordingly.

The transportation costs mentioned above are one example of the financial costs which might be avoided by individuals surrounding the project area if there is advance land acqui-

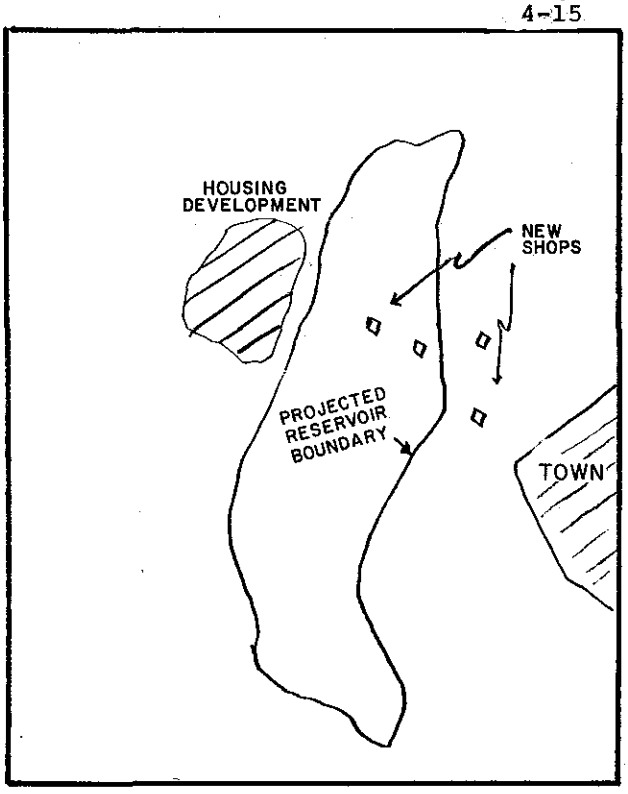

Figure 4-1: Non-Optimal Development Pattern in Vicinity of Project Site (See Text)

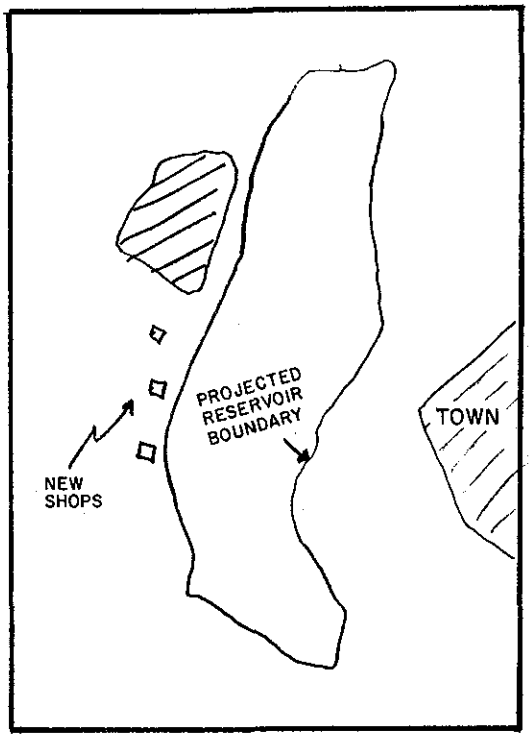

Figure 4-2: Another Non-Optimal Development Pattern in Vicinity of Project Site (See Text)

sition. The store that is not destroyed but does suffer a serious drop in business would be another external diseconomy of the reservoir construction which might be avoided by advance land acquisition.

One can imagine other possible scenarios which would similarly inflict financial costs on the surrounding population if there were no strong warning of the public intent as is offered through advance land acquisition. There may also be substantial non-financial costs. The bother and time of driving farther to stores or to work would be one such cost. Another would be the disruption to the community resulting from the demolition of part of it. Third might be the inadequate facilities that grow up to replace those that are lost in the project area -- such as a haphazard development of new but smaller (since they are serving a smaller market) stores next to the project area (see Figure 4-2). The new stores may not be any farther away than the original stores, but they are smaller, more scattered, and provide no sense of focus for the community. The people located near the project area might well feel a sense of psychic cost at the degradation of their community and its commercial facilities, a cost which might be avoided through advance land acquisition.

It is also possible that developments would be constructed around the project area which are quite incompatible with the project itself. An example might be a factory locating just outside the boundaries of the project which chose this site because of the waste-assimilative capacity of the stream or the availability of cooling water. The construction of the reservoir could eliminate both of these advantages, and impose costs on the plant that it would not have experienced

had it located elsewhere. In addition, the land it is located on might be much more valuable for housing or recreational facilities after the project is built than it is for a factory. The existence of the factory could further reduce the value of all the other land surrounding the reservoir for such purposes which would otherwise have been their highest valued use.

Again, the prevention of these costs is a benefit resulting from advanced knowledge, not necessarily advance land acquisition. It can be claimed for advance land acquisition only to the extent that such acquisition is a more effective indicator of intent than alternative means or is a preventive against subsequent undesirable land uses.

4.4 COSTS

4.4.1 Investment Costs

One of the primary costs which has to be considered by a private firm engaging in the advance acquisition of land is the present investment cost of purchasing the land. As discussed above, this is not a cost to society but a transfer between the taxpayers (and bond holders) to the land owner. These funds have an opportunity cost to society in that there are other resources that the public could obtain with these funds, and this choice now lies with the individual who has sold the land and to whom the funds have been transferred. However, he is a member of society, so society in the aggregate has given up no choices. One might argue that the social value of the resources that society would have chosen would be greater than the social value of the resources that the individual chooses, but unless there is a severe constraint on public revenues, this argument is usually rejected.[1]

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[1] If there is a budget constraint which necessitates the use of some ranking criterion, such as a benefit-cost ratio, the initial purchase price may enter into the denominator of the ratio. If there is no budget constraint, a situation in which the net benefits are greater than zero (when all costs and benefits have been determined on a present worth basis) is sufficient indication that the land should be acquired in advance. However, if the present investment budget is constrained, an appropriate criterion is to obtain the most net benefits per dollar invested. In this case the net benefits should be divided by the purchase price to determine the net benefit per dollar invested, and projects ranked according to this criterion. Other criteria have also been suggested for evaluating government investments but this seems to be the most reasonable criterion for advance land acquisition since the initial investment outlay does not really represent a social cost.

4.4.2 Management Costs

A continuing program of advance land acquisition, especially those utilizing approaches other than full fee purchase of the entire project site, may incur substantial additional management costs. These incremental costs, are mainly personnel costs borne by the administering agency.

4.4.3 Non-Project Uses Foregone

Parallel to the inclusion of benefits generated by the interim use of the land (between the initial purchase and the ultimate use), the social benefits that would have been produced from the land in the absence of advance land acquisition must be included in the aggregate costs. If the land is not acquired in advance, there would be a range of expectations that different types of private developments would occur on the project area. These developments would generate social financial benefits equal to the economic rent associated with their operation in that particular site. This economic rent would be limited by the additional cost that the enterprises or developments would incur if they were to locate in the best alternate site -- as they would presumably do if this site had been purchased by the government. Thus, the social benefit of their locating in this site would not equal the total rent they were willing to pay for the land, but the amount this exceeds the rent at an alternative location. If there is no economic alternative location, then the benefits would be equal to the difference between the gross income of the enterprises and the total costs (including a return to the entrepreneur) of the enterprise. Similarly, for residential land,

the increased rental (or the purchase) price presumably represents the advantages that this land has over alternative sites.

Some of these costs may also occur outside the project area in the same manner as some of the benefits would occur outside the project area. During the interim period, if individuals develop the surrounding lands in anticipation of the project being built, they may experience higher costs than they would have incurred had the project never been proposed. These additional costs may take the form of locating in a less desirable site, driving farther to work or shopping, etc. All of these are very uncertain costs because it is impossible to predict exactly what will happen in the project site if the land is not acquired in advance, much less what will happen to the developments that would have occurred in the project site if the land were acquired in advance, much less again what the additional costs associated with these adjustments would be. The obvious tendency is to estimate that these costs are negligible, assuming everything that would have happened in the project area will now happen somewhere else at no additional cost.

4.4.4 Planning Inertia

Perhaps one of the more serious costs associated with advance land acquisition is the cost of making inefficient ultimate decisions on the desirability of the proposed project because of planning inertia. It is easier to build a project if one already controls the site than if one has to acquire all the land as well. Although changing conditions and values often affect the social value of any particular project, once the site has been acquired there is substantial

inertia to go ahead and finish the project without re-evaluating its desirability. This inertia is accentuated by a common human desire to hide mistakes, resulting in some pressure to use the site for the originally intended purpose even if it is recognized to be undesirable.

Of course, the planning agency can avoid these costs by making a complete reappraisal of the project before going ahead with it. In addition to the expected investment and operation and maintenance costs of the project itself, the agency should also include the opportunity cost of the site. The land should not be valued at no cost, or at its purchase price, or even at its purchase price plus interest. It should be valued at the present worth of the net social benefits it would generate in its best alternate use.

4.4.5 Not Building the Project

There is always some probability that a planned project will never be built. In such a case, the benefits claimed for the strong signal of intent given by advance land acquisition will ultimately turn into costs. If the land around the project site is developed in such a way as to be compatible with the planned project, then it will probably be more costly than the optimal development in the absence of a project (otherwise the development with and without the project would be the same). If the project is never built, these additional costs will be experienced for the economic life of the developments that have grown up around the project site. They should be discounted to the present, multiplied by the probability of the project never being built, adjusted by a factor to take account of the degree to which the adjustments have taken place because of the advance acquisition, and the final product added to the expected costs of the advance acquisition.

It should be remembered that some of the costs are financial (increased transportation costs, wasted investments on recreational facilities, etc.) and some are non-monetary (the psychic costs of having adjusted to a situation which never occurs). In either case they would be very difficult to estimate.

4.4.6 Social Costs of Uncertainty

Since there is generally some degree of uncertainty as to the date construction will commence,[2] and even possibly uncertainty as to whether the project will be built at all, advance land acquisition will bring to the remaining residents, and those who wish to stay on their former land through leaseback or tenancy agreements, uncertainty as to how long they will be able to remain. This uncertainty may manifest itself in a variety of different ways; but in particular, older residents face the anguish of not knowing if a relocation is yet to face them.[3]

4.4.7 Differential Loss of Amenities and Services

In the case where leaseback or life tenancy arrangements are incorporated into the advance land acquisition program, it can be expected that the older and relatively more immobile

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[2]See Chapter 8. Construction of the Big-Wood Reservoir complex in Rhode Island has been successively delayed to the extent that opponents of acquisition of other reservoir sites are using the non-project use as evidence of non-need!

[3]See Lindesmith, S., "Social Psychology", Holt Reinhart, Winston, New York, N.Y., 1956 and Duhl, R., Editor, "The Urban Condition", Basic Books, New York, N.Y., 1961.

residents will stay on their former property so long as they are allowed to do so, whereas the owners of private businesses will tend to relocate as soon as a suitable opportunity arises. There may, therefore, be a gradual diminution of services provided by the private sector (gas stations, restaurants, stores, etc.), whose absence is perceived as a social cost to the remaining residents. Although this social cost is almost quantitatively immeasurable, it has been established qualitatively.[4]

4.4.8 Non-Maintenance of Tenant-Occupied Structures

A problem well recognized and documented in the field of advance land acquisition for urban renewal and metropolitan highway construction is the deterioration in maintenance of tenant-occupied structures, both residential and business. Once the project is announced, and land acquisition has commenced, incentives for adequate maintenance of such structures diminish.[5] Non-maintenance of tenant occupied structures may be common to all advance land acquisition undertakings, although this has not been documented statistically in the case of land takings for water resource projects. Maintenance of owner occupied homes may also be affected in the acquisition area due to increased difficulties in obtaining home improvement loans.

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[4]See Chapter 7.

[5]Jacobs, J., "The Death and Life of American Cities", Random House, New York, 1961, p. 300ff.

It is important to recognize that although the prevention of uneconomic immobile capital investments can be claimed as a major benefit of advance land acquisition, the absence of the very same immobile investments, such as represented by structure maintenance, must be counted as a social and environmental cost to the immediate residents of the affected area.

4.5 TRANSFERS.

4.5.1 Lost Taxes

Unless there are compensating payments, advance acquisition -- particularly for a large project -- can have a substantial impact upon local finances because of the elimination of tax payments on the site.[1] This is not a real efficiency cost since there are no real resources being lost, but a transfer from the local government to the level of government that has purchased the land.

When this loss of tax payments is particularly large (in proportion to the total tax receipts of the local government) there may also be some efficiency considerations involved. Because of its loss of income the local government may find itself unable to provide the level and quality of public services which it had before the land acquisition -- and which would be expected to be available in equivalent towns. This means that the marginal product of public expenditures would be higher in this town than in equivalent towns, which implies that there is an inefficient allocation of resources.

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[1]See Clyde T. Bates, The Effect of a Large Reservoir on Local Government Revenue and Expenditure (Lexington, Kentucky: University of Kentucky Water Resources Institute), 1969, for case studies of the effects of such tax losses on local revenues.

However, the efficiency considerations here are impossible to estimate and probably are relatively minor. Of more importance is the transfer of income from a small group of taxpayers to the larger group of taxpayers (assuming that the land is not acquired by a local government agency).

The amount of this transfer would be the amount of taxes that would have been paid on the land had it remained in private hands. If the land had been developed, this amount might have been quite large.[2] However, there are circumstances when the impact of this transfer might not be as serious as the gross amount of taxes lost would indicate. The loss of tax payments may be accompanied by a reduction in the need for public services. This depends upon what kind of private developments are being eliminated. From a purely public finance standpoint, the loss of factories is more serious than the loss of housing. The former typically pays more in taxes than the cost of the public service it receives. The latter typically receive more than they pay. The elimination of a new housing development might have a net positive impact upon the public finances.

4.5.2 Planning Blight

Another interim transfer type impact which can affect both the individual land owner and the local community is a condition which has been called "planning blight." If a public agency's plans are well known, and people adjust to them in expectation of the future public project, both the land owner and the community can be adversely affected in the interim. If the individual land owner tries to sell his land, he may find that its value has been substantially reduced -- since potential

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[2] This will be discussed further in section 6.3.

buyers know that it will be acquired soon for the public project, and, therefore, they can obtain little income from it. The private land owner has suffered a loss in net worth of his assets. Since no real resources have been lost, this is not an efficiency cost to society, but some may consider it inequitable. The public agency can eliminate this inequity by purchasing the land at a price that would have existed in the absence of general knowledge about the proposed project. Advance land acquisition can thus eliminate this type of planning blight.

The whole community may be in a similar situation. Normal development and maintenance may cease because of the expectation of the public project. New developments associated with the project will probably be delayed until the construction of the project has actually begun. In the interim, the community may be in a state of suspended development and maintenance of existing property. Presumably, of course, developments which would have otherwise occurred in the community will be occurring elsewhere, so there is no net cost to society (or what there is has already been covered under the discussion of costs). But the community and perhaps the wider region could consider this suspended development a cost in terms of local development and community and individual well-being.[3]

Advance land acquisition can correct the first type of planning blight -- that potentially experienced by the private land owner -- but can do nothing about the second type. For the second type, advance acquisition may actually make the problem worse because it gives even clearer indication of the public agency's intentions.

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[3] These social costs have been discussed in section 4.4.7.

4.5.3 Land Appreciation

As discussed above, part of the savings anticipated by the public agency may represent a transfer from the private land owner to the public, rather than an efficiency benefit. This is true when the savings result from different expectations about future prices rather than from different discount rates.

4.5.4 General Inflation

A transfer can take place from bond holders to the general public with advance land acquisition to the extent that the interest rate on government bonds does not take adequate account of general inflationary trends.

4.5.5 Speculation

Although governments are not supposed to pay more for land than it is worth in its best alternate private use, they often do pay more than the market price in order to acquire as much of the land as possible through free negotiations which avoid legal costs. Speculators realizing this tendency will often bid up the price of land proposed for a public project in order to capture some of the producer's (the public in this case) surplus.[4] Advance land acquisition will presumably

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[4]Several studies have documented the inflation in land prices following the announcement of a public project; e.g., D. C. Williams, Jr. and D. L. Daniel, The Impact of Reservoirs on Land Values: A Case Study, (State College, Mississippi; Mississippi State University, Water Resources Research Institute, June, 1969).

prevent this type of speculation and therefore result in a transfer away from the potential speculator to society (or more accurately, the elimination of a potential transfer in the other direction).

4.6 SUMMARY

A summary of the costs, benefits and transfers discussed in this chapter is given on Table 4-2, together with a brief outline of the method of measurement. The relative level of importance of each item, and the degree to which the item can be quantified and expressed in dollar terms in an ex ante evaluation is indicated on a scale of A-B-C-D, A representing either the highest importance or the easiest quantitative expression and D the least importance or the most difficult quantification. The difficulty of quantification is directly related to the accuracy that any such estimate may have.

TABLE 4-2: SUMMARY OF COSTS, BENEFITS AND TRANSFERS

	DESCRIPTION AND SECTION WHERE DISCUSSED IN DETAIL	MEASUREMENT CRITERIA
1.	Anticipated Appreciation In Land Values	Present value of expected future purchase price minus present price paid by agency in free negiotiation.
	Benefit (4.3.1)	Level of Importance: B Accuracy of Quantification: A
2.	Interim Land Use	Present value of interim land use benefits, either monetary from leaseback arrangements, or non-monetary valuation of, for example, recreation or wildlife benefits.
	Benefit (4.3.2)	Level of Importance: A Accuracy of Quantification: A
3.	Prevention of Uneconomic Developments	Present value of undepreciated portion of capital improvements initiated in the interim period which would be destroyed by future acquisition
	Benefit (4.3.3)	Level of Importance: A Accuracy of Quantification: C
4.	Reduced Transaction Costs	Estimated future transaction costs minus actual transaction costs, transaction costs being a function of average land parcel size.
	Benefit (4.3.4)	Level of Importance: B Accuracy of Quantification: B

5.	Improvements in Surrounding Developments	Impossible to quantify in advance of acquisition.
	Benefit (4.3.5)	Level of Importance: B Accuracy of Quantification: D
6.	Non-Project Uses Foregone	Present worth of benefits from uses of the land that are foregone by advance acquisition.
	Cost (4.4.3)	Level of Importance: B Accuracy of Quantification: C
7.	Management Costs	Present worth of management costs over the interim period.
	Cost (4.4.2)	Level of Importance: C Accuracy of Quantification: A
8.	Social Cost of Uncertainty	Qualitative assessment to be recognized by decision-makers in executing acquisition policy.
	Cost (4.4.6)	Level of Importance: C Accuracy of Quantification: D
9.	Differential Loss of Amenities and Services	Qualitative assessment to be recognized by decision-makers in executing acquisition policy.
	Cost (4.4.7)	Level of Importance: D Accuracy of Quantification: D
10.	Non-Maintenance of Structures	Qualitative assessment to be recognized by decision-makers in executing acquisition policy.
	Cost (4.4.8)	Level of Importance: D Accuracy of Quantification: C

11.	Planning Inertia	Impossible to estimate in advance of a decision to acquire or not acquire.
	Cost (4.4.4)	Level of Importance: B Accuracy of Quantification: D
12.	Not Building Project	Impossible to estimate at time of decision; presumably at the time of decision the proposed project is profitable, for otherwise there is no reason for land acquisition.
	Cost (4.4.5)	Level of Importance: B Accuracy of Quantification: D
13.	Lost Taxes	Present worth of tax revenue foregone minus present worth of tax reimbursements received.
	Transfer (4.5.1)	Level of Importance: A Accuracy of Quantification: B
14.	Planning Blight	Present value of loss in market worth of assets suffered by landowners because of time lag between project announcement and land acquisition, minimized by immediate implementation of acquisition.
	Transfer (4.5.2)	Level of Importance: C Accuracy of Quantification: B
15.	Inflation	Qualitative assessment only
	Transfer (4.5.4)	Level of Importance: D Accuracy of Quantification: C

16.	Speculation	Present worth of purchase price minus present worth of price in next best alternative use.
	Transfer (4.5.5)	Level of Importance: B Accuracy of Quantification: B

CHAPTER 5

SOCIOLOGICAL AND PSYCHOLOGICAL FACTORS

5.1 PROBLEM DEFINITION

5.1.1 Introduction

Sociological inquiry and concern is a highly important part of any comprehensive investigation dealing with urban management problems.[1] There is also growing recognition among urban investigators that the psychological state of individuals and groups has great influence on the way in which they react to any proposal that might affect them or is perceived to affect them. Thus, public acceptance of governmental activity is as much influenced by the manner in which the activity is presented and perceived as by the nature of the activity itself.

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[1]While sociology is generally regarded as the study of groups, and psychology the behavioral study of individuals, the application of psychological principles to group and institutional behavior is quite valid, and will be undertaken here. The same laws that govern the behavior of individuals generally hold true for the behavior of human groups; be they conservationists, communities, governments, or agencies of government.

5.1.2 Predispositions and Transference

The discrepancy between what is perceived as impact by individuals personally affected by advance land acquisition, and what is adjudged as the probable impact by a detached observer, is largely a matter of predisposition on the part of affected individuals. Our predisposition toward others is, unfortunately, most generally determined by what we hear and imagine about them. Predispositions are carried into all social interactions, and, in most cases, often determine their outcome.

Individuals, groups, communities, governmental agencies, institutions, etc., are each capable of as many predispositions as there are different contacts; i.e., an individual can be quite friendly toward local governmental officials and be absolutely hostile toward every state representative who crosses his path; a parks and recreation agency may be on good terms with the water resource agency and at odds with the highway agency. In that predispositions develop from out of the many things that happen to us, including that which is told to us and that which we have read, social psychologists have determined the origin of our predispositions as that of our "history of experience."

If our history of experience determines our predispositions, it can then determine our interpretation of future experience. If, for example, the predisposition of a conservation group toward a State Water Resource Agency is one of widespread mistrust, it is unlikely that this group would be able to recognize candor and a sincere attempt at communication on the part of that Agency.

The discrepancy between perceived impact and actual impact, conditioned by predispositions in turn determined by the "history of experience," has been noted in many investigations relative to the social impact of water resources projects. For example, a recent study on the socio-economic impact of the Connecticut and Millers River Diversions in Western Massachusetts[2] observes in commenting on perceptions relative to public recreation opportunities:

> All this notwithstanding the perception of local residents is that they will be "cheated" of their inalienable rights to free access. The Quabbin experience has rankled in their minds for some thirty years, and references to an M.D.C. "no-man's land" are not uncommon. Their fears are of total exclusion--an eventuality as unlikely as completely unrestricted trespass.[3]

The importance of negative predispositions to the success of any water resources project, and advance land acquisition projects in particular, becomes paramount where predispositions of groups, rather than individuals are concerned. For example, the negative predisposition of the cohesive group opposing the Connecticut and Millers River Diversion was explained in terms of its "history of experience" as follows:

> Because of the nature of the project under consideration, it is revealing to examine the source of the unanimity. The construction of Quabbin Reservoir in the late 1930's was a shock to the

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[2] "Identification and Assessment of Social and Economic Impacts of the Connecticut and Millers River Basin Diversion," Report by Abt Associates to the New England Division, Corps of Engineers, June 1972.

[3] Ibid, p. 47.

> cultural and economic life of the area from which it has never fully recovered. As the testimony of several local people at the Orange hearing indicated, many of the residents of the towns affected by the proposed Tully Complex consider themselves refugees from the Quabbin site. In connection with the construction of this (Quabbin) reservoir, the corporate existence of the four towns of Enfield, Dana Greenwich, and Prescott was terminated. Thirty-six miles of state highways were relocated, and sixteen miles of the Boston and Albany Railroad were also abolished. About 2500 persons living in 650 houses in the area were required to find new homes. A new cemetery, known as Quabbin Park Cemetery, was built in the town of Ware and 1761 bodies previously buried in thirty-four cemeteries in the area taken for reservoir purposes were removed to the new cemetery. Residents of the supplier towns feel themselves to be threatened once again. That is the root of their common cause and the most important cohesive factor in their alliance against the diversions proposed.[4]

Group membership need not be physical; it can be symbolic as well:[5] fellow-citizens, fellow-taxpayers, etc. Extension of symbolic group membership from the group directly affected by an advance land acquisition plan, to the public at large, has played a major role in the defeat of statewide referenda for bond issues to finance advance land acquisition. Indeed,

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[4] Ibid, p. 49

[5] Altshuler, Alan, "New Institutions to Serve the Individual," Environment and Policy, Ewald, William, R. Jr., editor, Indiana University Press, 1968, p. 238.

defeat on a statewide level can be attributed to a successful appeal by the affected community to "fellow-taxpayers."[6]

These problems of negative disposition may be compounded by the social psychology of transference. This phenomenon is aptly described by Abt Associates in connection with the perceived impact of the Connecticut and Millers Diversion proposals:

> Further, it appears to be irrelevant that the disruptive influence of the Tully and Northfield Projects is negligible by comparison with Quabbin. The social psychology operating here is transference; water for Boston means the bureacratic machinery of the Metropolitan District Commission, the M.D.C. means wanton despoilation of all that local residents hold dear, and that means a repetition of the upheaval brought by Quabbin in the Millers Basin. To point out that this connection is illogical or to argue that appropriate safeguards for local interests will be devised has been of no avail. Past experience, just as in the Brockton dispute, is all-pervasive and predispositions in the listener are ineradicable.[7]

This phenomenon is much in evidence in Rhode Island in connection with land acquisition proposals for water supply reservoirs. Burrillville residents opposing the proposed Nipmuc and Tarkiln water supply reservoirs cited the delays in the construction of the Big-Wood River Reservoir Complex, already acquired by the state, as evidence of non-need; the

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[6] See also Section 6.3.

[7] Abt Associates, op. cit., p. 50.

fact that the Nipmuc and Tarkiln Reservoirs are needed for the Woonsocket, rather than the Providence System, was to the opponents irrelevant.[8] Indeed, in discussions with local communities, the resentment was not directed at the Water Resources Agency, or at the residents of the area that the proposed reservoir would serve. Resentment was directed toward "the State;" evidently, water for northern Rhode Island means a taking by the State; and any taking by the State is perceived as an attack on "home rule" and the traditional exercise of limited autonomy in the organization and management of local affairs.

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[8]See also Section 6. 3.

5.1.3 Relocation

There is as much difficulty in making a psychological adaptation to the change in location as there is in making the physical relocation. Unlike suburbanites, rural and city people alike relate strongly to the often unique set of places, experiences, and relationships of their communities and neighborhoods. Relocation often means disruption of group identity, discontinuity of external stability and familiarity, fragmentation of routines, relationships and expectations; if on a large enough scale, the disruption of on-going community processes is affected.[9] Older residents in particular, who have spent the greater part of their lives at one place, find relocation extremely difficult, if not impossible, to cope with. Not only are familiar places and faces removed from their lives, but their daily routine is significantly disrupted and unlikely to stabilize again.

The problems of relocation have been extensively studied and analyzed in connection with Urban Renewal Programs and highway construction.[10] Although such projects often involve thousands, rather than tens or hundreds of relocations, and are generally concerned with urban rather than rural populations, the little documentation available on water resource project related relocation suggests that similar forces are in effect. Foster[11] conducted several surveys to analyze the relations between

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[9]Fried, Marc, "Grieving for a Lost Home," Duhl, Leonard J., M.D., The Urban Condition, Basic Books, Inc., New York, 1963, pp. 151-157.

[10]See, for example, Colony, D. C., "Socio-economic and Environmental Effects of Right-of-Way Acquisition," Report to Federal Highway Administration, April, 1971 (Available from the National Technical Information Service as No. PB-207 304.) or Anderson, M., "Consequences of Urban Renewal," Chard and York, editors, Urban America: Crisis and Opportunity, Dickinson Publishing Co., Belmont, California, 1969.

[11]Foster, op cit.

governmental acquisition and immediately affected landowners. Problems cited included inconsistencies in dealing with individual landowners, the omnipresent threat of eminent domain takings, lack of local participation in the acquisition program, and the high degree of secrecy believed to be employed by the acquisition agent. These are the problems as perceived by the affected landowners; and unless they are resolved equitably, the relocation experience is likely to become an important focus of the individuals history of experience, even if no negative predispositions toward the agency exist prior to acquisition.

5.2 AN APPROACH TO PROBLEM SOLUTION

We have identified the cause of hostile reaction to public agency sponsored projects in terms of negative predisposition and the history of experience. It follows directly from this cause and effect relationship that no matter what the merits of the particular proposed project, or how sincere an effort is made to present the agency viewpoint at the time of the project planning, existing negative predispositions will be strengthened, not weakened. Consequently, it is the history of experience that we must attempt to influence; and therefore whatever measures are suggested in remedy must be continuing, long-term programs that will gradually be integrated into the history of experience of potentially impacted groups and individuals.

Lack of information and, in many cases, an abundance of misinformation can be singled out as key ingredients of the failure of many advance land acquisition projects for water resources projects. Therefore, we conclude that a public information service be instituted by the agencies concerned not merely at the time of a particular project, but as a permanent feature of agency activity. Short-term attempts, no matter how sincere, will intensify negative predispositions rather than affect the history of experience. Consequently, they are doomed to failure. As a very minimum, we, therefore, conclude that:

> Water resource agencies that are involved in advance land acquisition programs must fund at least one Information Service Officer position along with sufficient funds for extensive operations. This Officer must spend the bulk of his time operating in the affected communities and there dispense information to municipal governments and citizen groups as well as on an individual basis.

> He must be able to develop clear explanatory articles for the news media, as well as participate in radio and television public discussion programs. The Public Information Officer needs to be highly competent in the area of water resource management, and have a demonstrated interest and competence in public education.

Although a continuing public information and education program may play a major role in diminishing vociferous and politically powerful opposition by modifying the history of experience of the affected groups as a whole, there is also a strong need for the sponsoring jurisdiction to do its utmost to minimize the impact on the individual landowners affected by the acquisition or preservation methods. If the relocation experience is not to become a new focus of negative predisposition (which would tend to offset the efforts of the public information service), the affected landowners must above all be satisfied that whatever grievances they may have are resolved equitably.[1] The 1970 Federal Uniform Relocation Assistance Act[2] will help to ease the burden upon property owners by providing broader financial and advisory aid. The uniform provision of relocation benefits from various Federal agencies may also reduce criticism of the Corp's methods which have been correspondingly revised and improved.

However, we find that in order to resolve unforeseen grievances impartially, agencies involved in active advance land acquisition programs should press for the creation of a land acquisition ombudsman.[3] An ombudsman is a high-level public servant with adequate salary and staff, free and independent of the agencies he may involve himself with, and the power that appoints him.

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[1] See also Foster, op. cit., p. 12.

[2] Public Law 91-646 (1970), 84 Stat. 1894.

[3] See e.g. American City, "Ombudsman," May 1968, p. 404.

He has the power to investigate administrative practices, on his own initiative, and to subpoena records. His sole duty is to act on complaints and grievances from citizens. His principal weapons are publicity, criticism, and personal persuasion and prestige. Thus a useful suggestion might be to select a person from each affected region, who is well known and respected in that geographic area.

Examples of the general government ombudsman in other parts of the world, where he is responsible for overseeing the actions of most government officials, are found in all of the Scandinavian countries, including Denmark, as well as in New Zealand, Russia, Yugoslavia, New Britain and parts of Canada. The concept originated in Sweden in 1809, but today there have even been proposals in the United States Congress that call for the establishment of an "Administrative Ombudsman."[4] By 1967, legislative bills had been introduced in 25 states, authorizing the appointment by the legislature of a person empowered to investigate complaints on certain administrative actions. In other countries the ombudsman usually operates only at the national level and is often paid a salary equivalent to our Supreme Court Justices. He may act on his own without a formal complaint, allowing him to pursue grievances aired in the press or expose maladministration brought out in investigating an unfounded complaint.[5] Most countries exclude the courts and cabinent officials from his jurisdiction and essentially limit his powers to investigation. However, in Denmark and a few other countries, the ombudsman may order the public prosecutor to begin civil proceedings or that disciplinary

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[4]U.S. Congress, Senate Subcommittee on Administrative Practice and Procedure, Administrative Ombudsman, 90th Cong., 2d Session, 1968; See also H.S. Reuss (Cong. Rep., Wisconsin) "An Ombudsman for America," N.Y. Times Magazine, (Sept. 13, 1964), p.30.

[5]"Canadian Ombudsman Proposals" by Stanley v. Anderson, Institute of Governmental Studies, Univ. of California, Berkeley, Nov. 1966, pp. 40-66.

action be commenced by the appropriate authority.[6] In general, the right of appeal to the ombudsman does not depend on exhaustion of administrative remedies when the complaint is against the handling of "a citizen's business with the government agency" rather than against the substance of the decision. Often there has been the requirement of a fee submitted by the complainant in order to dissuade unsubstantial complaints.

While the above examples are concerned with offices which have jurisdiction over several or all national and local government agencies, we are interested in a single-agency official. The U.S. Department of Commerce has an Ombudsman for Business[7] who serves more as a liaison with the Department than an investigator. Massachusetts,[8] and several other states, have recently proposed an ombudsman within the prison system. The Buffalo, New York experimental program, although it deals with matters involving all levels of government, is unique in that it seeks out complaints in the community by setting

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[6] Ombudsmen and Others: Citizens' Protectors in Nine Countries, by Walter Gelhorn, Harvard Univ. Press (Cambridge, 1966), pp. 5-47.

[7] 37 Federal Register 25559 (1972).

[8] It should be noted that in 1967 a bill (H. 2677) was introduced into the Massachusetts legislature proposing an "Information and Referral Agency of the Office of Ombudsman" to: (1) monitor the records and procedures of all administrative board of appeals; (2) provide information on the purpose, scope and procedures of all major State programs; and (3) investigate complaints of administrative action or inaction. "Proposals and Politics," Ombudsman for American Government? Stanley V. Anderson, ed. (American Assembly, 1968) p.157; see also House Bill 1519 submitted in 1969 by Representative Nolen of Ware; and "An Ombudsman for Massachusetts," Office of Planning and Program Coordination, (May, 1969).

up neighborhood offices. The experience of that project was that complainants do not seek out the ombudsmen unless there is basis to their grievance.[9] After reviewing the success of the government administrative ombudsman in other countries, it would seem that one whose duties were concentrated within a single agency might find himself with even greater persuasive or directive powers to settle complaints within the department. Otherwise an aggrieved person would have to seek review of an administrative decision through the courts, a costly and time-consuming procedure.

For the purpose of amending perceived wrongs in the methods of advance land acquisition for water supply reservoirs, the ombudsman should be able to investigate all of the records pertaining to the particular complaint. He should be able to bring together the complainant and the appropriate official to arbitrate any substantial dispute, or himself represent the aggrieved person and present his conclusions and recommendations to the official. Before arriving at his conclusions he would be required to consult the administrator in charge of the project to determine if the complaint has standing.

Appointment of the ombudsman should be at the highest level, such as, for the Corps of Engineers, by the Chief of Engineers or, on the regional level, by the Office of the Division Engineer. A committee of State officials and prestigious citizens might be formed to advise and review the appointment.

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[9] "Buffalo Citizens Administrative Service: An Ombudsman Demonstration Project," by L. Tibbles and J. Hollands, Institute of Governmental Studies, University of California, Berkeley, 1970.

Funding for the office might be from several sources involved in advance reservoir site acquisition within a region, suggesting that one ombudsman might serve several jurisdictions, although this idea would be hindered by the difficulty of coordinating diverse agencies. The funding may be supplemented by requiring a small fee, such as five dollars, for each filed complaint.

Yet, the ombudsman is not a substitute for civic reform. He can isolate aberrations, suggest better ways of reaching agreed ends, and point out new applications of previously accepted concepts, but he does not have the power to punish or reverse administrative decisions.

While the Federal Uniform Relocation Assistance Act helps to alleviate the traditional conflicts between the sponsoring agency and the displaced person, we feel that an independent, impartial, high-level functionary is necessary as an arbitrator for grievances which are not covered by the act or whose resolution is not clear to the complainant. An immediate objection that might be raised against the ombudsman concerns the function of public servants. State or Federal employees are servants of the public; and their principal responsibility is to safeguard and promote the interests of the public they serve. Why, therefore, do we need an additional public servant? The answer is that in the typical landowner-agency conflict that arises in land acquisition for a public purpose, the agency and its staff is no longer perceived as the servant of the individual but as his opponent.

CHAPTER 6

A PLANNING MODEL

6.1 INTRODUCTION.

From our analysis of the legal, economic and sociological framework it is clear that the difficulties of successful advance land acquisition lie not in an absence of legal tools, or in the inability to identify the costs and benefits, or in the lack of understanding of the causes of local opposition. Rather, the difficulties are institutional, and the choice of institutional arrangements is more important than, for example, the choice of one or another of the tools of site preservation.

The choice between preservation tools is so wide, and the typical reservoir site is so heterogenous in its land use and human and economic characteristics that no one single tool can be advocated. Even if the site is defined, changing future conditions call for a flexible approach with regard to choice of tool.

Consequently it is very difficult to define an optimal strategy for advance land acquisition, and we can talk only in terms of an optimal planning process rather than in terms of an optimal plan. In practice, definition of a planning process implies definition of the institutional arrangements within which the decision-makers operate.

We turn therefore to a closer examination of the institutional aspects of advanced land acquisition. Section 6.2 looks at administrative arrangements in the light of established precedents in advance land acquisition for purposes other than water resources projects. Section 6.3

examines the practical aspects of economic analysis, and Section 6.4 discusses the various mechanisms for the reimbursement of local tax losses, the latter being one of the most important issues in advance land acquisition. Finally Section 6.5 presents a comparative analysis of site preservation tools to aid the decision-maker in his choice of approach.

6.2 ADMINISTRATIVE ASPECTS

The question of administration of an advanced land acquisition or site preservation program is a central issue. In particular, the question of who undertakes the planning program may be crucial to its success.

It is perhaps axiomatic that a program for site preservation for water resources projects has very low public credibility if it is formulated without reference to a plan for water resources development and without reference to comprehensive land use planning.

Much of the recent effort in water resources planning is, indeed, on a basin-wide level transcending state boundaries, of which the New England Corps of Engineers' Connecticut River Basin study and the New England River Basins Commission's (NERBC) efforts in Southeastern New England are typical examples. However, in terms of implementation of plans relative to site preservation, NERBC must rely heavily on the states, because the necessary legal powers are vested at the state rather than interstate level. With regard to Federal agencies, although they have powers of eminent domain, they do not have zoning or real estate taxation powers. Also, the responsibilities of the major Federal agency involved in water resources planning, the Corps of Engineers, have by law, been focussed on flood control navigation, and an extension to involvement in water supply is a major innovation, although not undesirable.[1] Nevertheless, in terms of direct administration of a site preservation program, certain questions arise with respect to

[1] The Northeastern United States Water Supply Study, conducted by the Corps, is in itself the first evidence of such an involvement.

congressional limitations on the funding of Corps of Engineers projects. Examples of such financing limits are contained in the Flood Control Acts of 1941,[2] 1948,[3] 1954[4] and 1962[5] and the Omnibus Rivers and Harbors Flood Control Act of 1965,[6] as well as other acts[7] which specified that State and local interests must bear part of the costs of Corps projects.

Planning for water supply in New England has traditionally been at a municipal level, with cities using their powers of extra-territorial condemnation to acquire sites outside their immediate jurisdiction. Because a municipality does not have the power to zone or the power to effect tax policy incentives outside its boundaries, it is doubtful that successful long-term preservation policies can be conducted at a local level. More recently, however, regional planning commissions have become involved in planning for water supply on a regional level. These plans are financed in part by several Federal agencies, notably the Comprehensive Areawide Water and Sewer Planning grants of the Farmers Home Administration, and the Comprehensive Planning grants of the Department of Housing and Urban Development.[8] But more importantly, such regional plans have official standing in many New England states,[9] and where Federal assistance

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[2] 55 Stat. 638.

[3] Sections 205 & 206, 33 U.S.C 701s, 701 n.

[4] Section 202, 33 U.S.C. 701b-8.

[5] Section 205, 33 U.S.C. 701 s.

[6] Section 201, 42 U.S.C. 196 2d-5.

[7] 43 U.S.C. 390b (1958); 16 U.S.C. 4601-12 (1965).

[8] See Parshley, P.C. "Coordination of Federally-Assisted Sewer and Water Programs," AIP Newsletter, Vol. 7, No. 8, pp. 12-14 for a detailed discussion of these programs.

[9] See e.g., 24 VSA91, S 4345-4385.

is concerned, regional planning commissions have powers to effectively withhold Federal aid if proposed projects are inconsistent with federally approved regional plans under the A-95 review procedure. Therefore, with reference to establishing priorities for the preservation of water supply reservoir sites, regional planning commissions, where they exist, must be included in the decision-making process.[10]

In summary, even though the State Water Resources Agency is the most suitable for administration of an effective reservoir site preservation program because of financial and legislative reasons, the planning program and its priorities of preservation of the state agency must be formulated in consultation with the Regional Planning Commissions on one hand, and the interstate and Federal agencies involved in water resources planning on an interstate, basinwide basis on the other. The establishment of formal institutional arrangements for consultation with these bodies should, therefore, be a first step in the implementation of a site preservation program conducted by a state agency.

[10]Rhode Island is a special case, in that there is only one Regional Planning body, the Statewide Planning Agency.

6.3 ECONOMIC ANALYSIS IN PRACTICE.

In Chapter 4 we identified the costs, benefits and transfers associated with advance land acquisition, and assigned them to the accounts of the Water Resource Council System. But we have yet to answer the question of practical measurement of the costs and benefits, and to assess their relative importance. Also, we have conducted the analysis in terms of society as a whole, which is relevant only to Federal decision-making. Where state agencies or municipalities are concerned, the niceties of economic theory may be quite irrelevant to a plausible demonstration of net benefits and to successful implementation. The realities of implementation demand a clear demonstration of tangible economic benefits coupled with a commitment to alleviate the social costs of those losing their property in a sensitive and sympathetic manner.

Unfortunately, there is no statistical data available upon which we could base some empirical rules for estimating quantitatively the items of interest, and only one quantitative ex post[1] analysis of an advance land acquisition program was discovered in the literature survey.[2] This, of course, is due mainly to the absence of advance acquisition programs to be studied!

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[1] An ex post analysis is after the fact, whereas an ex ante analysis is before the fact.

[2] Shoup, D. C. and Mack, R. P., in "Advance Land Acquisition by Local Governments," U. S. Department of Housing and Urban Development, Washington, D. C., analyze two programs in Montgomery County, Maryland and Richmond, Virginia. Both were for advance acquisition of small sites for municipal services such as education.

Indeed, there are very few ex post analyses of the economic performance of any public water resources investments:

> Only very recently has it been possible to find any significant research at all that focuses on the economic results of public undertakings after they have had time to develop a performance record. Neither the criteria for ex post evaluation nor approaches for measuring economic results are at all well developed. The development of consistent techniques for evaluating the effectiveness of public program performance on an ex post basis should be a high priority item on the research agenda of economists and other social scientists concerned with public policy. Indeed, it is now clear that further extension of the application of ex ante economic analysis to public expenditure programs requires the demonstration that such analysis offers some prospect of isolating those programs and investments that would increase the net social return. Neither in the literature of public expenditure analysis nor in government practice should the efficacy of ex ante benefit-cost analysis continue to be accepted as a matter of a priori logic and faith.[3]

Consequently, we are not in a position to compare our expectations of costs and benefits to actual costs and benefits as experienced by others. Furthermore, because of the absence of other case studies on advance land acquisition, our inventory of costs and benefits are based largely on our own obser-

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[3]Haveman, R.H., The Economic Performance of Public Investments, Johns Hopkins Press, Baltimore, Maryland, 1972, page 2.

vations of the Rhode Island case study to be described in more detail in Chapter 7. And insofar as Rhode Island exemplifies the difficulties of implementing advance acquisition rather than illustrating a successful program, general estimates of a quantitative nature lie beyond the scope of this study. We must therefore restrict ourselves to some general guidelines for economic decision-making, rather than presenting a generally applicable formula.

6.3.1 The Timing of Acquisitions

As noted both in the introduction and in Chapter 4, the major reason for site preservation is the prevention of immobile capital investments that do not adequately consider the shortened life resulting from reservoir construction. Consequently, in a completely static situation where no significant capital improvements are contemplated, the need for advance acquisition diminishes. In a dynamic situation, however, it also follows that the only tracts that need be acquired are those on which improvements are contemplated. Since it is not generally known at which point in the future time improvements will be made, it appears that the optimum policy is to wait with acquisition until such time as the owners give notice of intent to improve; i.e., wait until a building permit or subdivision application is filed. If the problem of separating speculative applications from genuine applications can be solved, then a determination of the optimum time of acquisition is easily stated; namely at the time of intended improvement.

6.3.2 The Measurement of Tax Losses

Unquestionably, the most important transfer is the tax loss to the local community, and Section 6.4 is devoted to a discussion of the mechanisms available to offset the tax im-

munity given that the tax loss is indeed measurable. But unfortunately, the problem of measurement of this tax loss is beset with difficulties. In the first place, once a site is acquired, we cannot accurately state what land use developments would have taken place in the absence of acquisition, although such developments are limited to some extent by the existing zoning classification. An attempt at estimating the difference in assessed valuation becomes equally difficult, and even speculative as the time period between acquisition and attempted measurement increases. One suggestion might be to evaluate a similar site not acquired for public investment and thereby assess the possible development of the preserved site.

In practice, however, the only method of measurement is indirect, with the dollar loss in assessed value at the time of acquisition as a starting point. Adjustments for the following factors can then be made on a case by case basis to arrive at some equitable estimate:

1. The assessed value of the acquired properties may be several years old, and an allowance should be made for an appropriate increase since the last revaluation.

2. An adjustment should be made annually to reflect inflation. Clearly, the real value of a fixed reimbursement to a community decreases year by year due to inflation. In the absence of acquisition by the tax exempt jurisdiction, and even in the absence of improvements, future revaluations of the property could be expected and would, therefore, at least keep abreast of inflation.

3. An adjustment should be made to allow for changes in the quantity and quality of community services resulting from the acquisition. But two caveats must be reiterated if we are to avoid the trap of suggesting simplistic panaceas. First, it is often assumed that, as land is acquired by the sponsoring

jurisdiction, residents will begin to leave the area, and therefore fewer community services must be provided (less fire and police protection, less water, less wastewater to be treated, etc.). Consequently, it is argued, tax losses, due to loss of both property and non-property (sales, income, etc.) taxes, to the community are offset by savings in services and therefore the need for offsetting payments will cease once the project is built. This argument ignores the fact that cost-service functions for providing community services are non-linear.[4] In particular, there is no linear relation between assessed valuation and amount of service. Thus, a ten percent loss in assessed valuation in no way implies a ten percent reduction in services. Also, there is no linear relation between cost of service and quantity of service; thus, a ten percent reduction of town highways does not imply a ten percent reduction in highway maintenance. And finally, residents who do leave the project area will tend to relocate in close proximity to their former homes in the same community if the opportunity allows; thus, there may be no change in the net number of people served.[5]

Second, there is ample evidence to suggest that property values, and hence assessed valuation and tax revenues, increase rather than decrease, once the reservoir project is ultimately

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[4]See, among others, Isard, W. and Coughlin, R., "Municipal Costs and Revenues," jointly published by the Federal Reserve Bank of Boston and the American Institute of Planners.

[5]This has been documented in the case of relocations due to highway construction: see, among others, Colony, D.C., "Socio-Economic and Environmental Effects of Right-of-Way Acquisition," Report to Federal Highway Administration, April 1971/Available from National Technical Information Service (NTIS), #PB-207 304.

constructed.[6] Thus, the net long-term impact may be an increase, rather than a decrease, in property tax revenue. But where acquisition is well in advance of construction, the interim period of net tax loss may be substantial.

It should be clear that no general and universally applicable formula can be developed to quantify this adjustment. Rather, it will require case by case evaulation.

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[6] See, among cthers, Schutjer, W. and Hallberg, M.C., "Impact of Water Recreational Development on Rural Property Values," American Journal of Agricultural Economics, 50 (1968), pp. 572-583; or Knetsch, J.L., "The Influence of Reservoir Projects on Land Values," Journal of Farm Economics, 46 (1964), pp. 231-243; or David, E.J., "The Exploding Demand for Recreational Property," Land Economics, XLV (1969), 2, pp. 206-217.

6.4 MECHANISMS FOR THE REIMBURSEMENT OF LOCAL TAX LOSSES

There are three cases of reimbursement to local communities to be examined: reimbursement by the Federal government (and its agencies), reimbursements by State government (and its agencies), and reimbursements by other local jurisdictions.

Looking first to the future, it is likely that the dependence of local communities on real estate taxation for their prime source of revenue will diminish. It has been proposed that a value added tax be instituted nationwide as a source of revenue to finance local education; because education expenditures constitute the major item on local community budgets, real estate taxation would thereby be reduced significantly.[1] This reduction would also tend to reduce the impact of tax exempt land acquisition on local public finance.

But in the interim, we must look to other mechanisms for tax loss reimbursements. The value added tax has many opponents, particularly because it is a regressive tax, with low income persons contributing a larger percentage of their total income than the rich.

6.4.1 Reimbursements by the Federal Government

Federal land concentrations range from less than ten percent of the land base in most eastern states to 96 percent in Alaska in 1967[2] and remove precisely that amount of land from the local real estate tax base. This has resulted in more than 40 different programs by various revenue-sharing and payments-in-lieu of taxes systems that seek to offset the tax immunity.[3]

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[1]The motivation, of course, has nothing to do with the tax nature of Federal land; rather it is to alleviate the inequities of educational opportuneties that result from rising revenue from property taxes.

[2]Statistical Abstract of the United States, 1968 (89th Edition), U.S. Bureau of the Census, Washington, D.C., 1968.

[3]Seastone, D. "Revenue Sharing or Payments in Lieu of Taxes on Federal Lands," Land Economics, 47, 1971, p. 373-381.

In a recent report to the President and Congress[4], the Public Land Law Review Commission (PLLRC) analyzed these programs in some detail. They concluded that revenue-sharing programs were not desirable as a means of offsetting tax immunity of Federal lands, and strongly advocated payments-in-lieu of taxes systems. The PLLRC felt that reimbursements should be directly linked to tax loss, independent of the type of land resource program since different resource programs have different revenue producing characteristics. Insofar as few water resource programs on a Federal level result in market-type activities, the conclusions of the PLLRC are accepted by this contractor with regard to water resource project tax immunity.

6.4.2 Reimbursement by State Agencies and other Local Jurisdictions

Although the necessity for reimbursement of tax exempt state and municipal jurisdictions to provide tax relief to the community where the acquired sites are located is widely recognized, there appears to be little uniformity in the methods of reimbursement. Nevertheless, three general approaches can be identified.

The first approach makes use of a fixed formula for the tax reimbursements that generally limits the payments to a specified number of years, and often sets forth a series of decreasing payments.

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[4] Public Land Law Review Commission, "One Third of the Nation's Land", Washington, D.C., Government Printing Office, 1970.

For example, the Act authorising the acquisition of the Big River-Wood River Reservoir Complex in Rhode Island stipulates as follows:[5]

> Sec. 22. Exemption from taxation-Reimbursement. -All real property in the state of Rhode Island acquired by said board pursuant to this act shall be exempt from taxation, but if the assessed value of the real property described in section 18 in any city or town shall exceed 25% of the assessed value of all of the real property in such city or town, not exempt from taxation, as of the December 31st immediately proceding the first such acquisition of real property therein by said board, then in July of the year following the year of such acquisition, in lieu of taxation, the state shall pay to such city or town an amount equal to that which such city or town received for the taxes assessed December 31, 1963, upon such real property acquired by the state in the area so described, valued with buildings or other improvements thereon. In July of each succeeding year, the state shall continue to pay to such city or town such amount, as the same may be increased on account of real property thereafter acquired by the state for such purpose within said city or town; provided, that in each successive year following the initial year of payment by the state, on account of each parcel so taken, the amount such city or town would have received on account of such parcel shall be reduced cumulatively by 4% so that the state's liability under this section shall terminate after 25 annual payments on account of such parcel. Any city or town receiving such payments shall continue to maintain the roads bounding on the parcels

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[5] Rhode Island H. 1624, approved by statewide referendum in November 1964.

> so taken for a period of 10 years commencing January 1, 1965, or, if shorter, until commencement of construction of a reservoir on any of said property acquired by said board in said city or town.

Massachusetts municipalities are also allowed to take advantage of this approach. Property held in another municipality for the purpose of water supply is exempt from taxation, if yielding no rent. However, annual payments are made in an amount equal to the average of the assessed valuation for the three years preceeding ownership, the valuation for each year being reduced by succeeding abatements.[6]

From the donor community viewpoint, there are a number of disadvantages to this approach. First, there is no a priori reason to suppose that tax losses diminish to zero after twenty-five years; the declining payment system presumably reflects the philosophy of diminishing need for community services. This philosophy violates the first caveat of Section 6.4. Second, by relating reimbursements to a particular year, adjustments to allow for inflation and reassessments are denied to the donor community. Inflation alone, over a period of years, will reduce the real value of the tax reimbursements. Finally, the stipulation that at least 25% of the assessed valuation must be lost to the town for any reimbursement to be provided at all is quite arbitrary, and seemingly inequitable.[7]

The second approach is that of an annual review of payments in lieu of taxes by an independent party, without time limitation or fixed formula for payments. For example, the Act of the Massachusetts Legislature authorising Pittsfield to take land in Windsor by eminent domain for a proposed water supply reservoir stipulates:[8]

> "In the year nineteen hundred and sixty-nine and annually thereafter, the city of Pittsfield shall pay, on July first of each year

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[6] 59 MGLA 6&7.

[7] See also footnote 14 to Section 6.4.3.

[8] Massachusetts House No. 4708, June 1968, Section 8.

> to the town of Windsor in lieu of taxes on certain property held for municipal purposes by said city of Pittsfield in said town of Windsor, an amount to be determined annually by the commissioner of corporations and taxation. The commissioner shall certify the amount so determined to the assessors of said town of Windsor and the mayor of said city of Pittsfield on or before March fifteen of each year. The assessors of said town of Windsor or the mayor of said city of Pittsfield, if aggrieved by the determination of the commissioner, may, on or before April first, appeal to the appellate tax board whose decision shall be final.

Most land held by the various State resource agencies in Massachusetts are exempt from general taxation, with payments in lieu of taxes made to the municipality in which the land is located. A new assessed valuation is determined every five years, but payments are annual.[9]

The third type of reimbursement is not directly related to the real estate tax loss suffered by the donor community; rather it reflects a general desire on the part of the sponsoring jurisdiction to make some sort of offsetting payment for the exempt land. A typical arrangement is that adopted by the Rhode Island legislature in the case of the towns of Coventry and West Greenwich. The legislation relative to West Greenwich reads:

> AN ACT to Provide Reimbursement to the Town of West Greenwich for the Cost of Educating Children Who Live in an Area of Said Town Which Has Been Taken by the State for the Purpose of Constructing the "Big River-Wood River Reservoir" Pursuant to Chapter 133 of the Public Laws, 1964.[10]

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[9] 58 MGLA 13.

[10] Rhode Island, S. 834, January session 1971.

WHEREAS, The state has taken a large area of the town of West Greenwich by the power of eminent domain pursuant to chapter 133 of the public laws, 1964, for the purpose of constructing the "Big river-Wood river reservoir"; and

WHEREAS, By virtue of the said acquisition, the said area is no longer subject to taxation by the said towns and

WHEREAS, Construction of the said reservoir has not been commenced; and

WHEREAS, Many families have been living in the said area since the said acquisition and will continue to live there until all dwellings situated thereon have been destroyed; and

WHEREAS, Many members of the said families are children who are enrolled in the public schools of the said town and will continue to be so enrolled at least until all of the dwellings situated upon the said area have been destroyed; and

WHEREAS, The said town has been required since the said acquisition and will in the future be so required at least until all of the said dwellings have been destroyed, to incur the expense of educating the said children even though said town has been deprived, as aforesaid, of all real estate tax revenue from the said area,

It is enacted by the General Assembly as follows:

Sec. 2. The general assembly shall annually appropriate such sum as it may deem necessary to carry out the purposes of this act; and the state controller is hereby authorized and directed to draw his orders upon the general treasurer for the payment of such sums as may from time to time be required within the amount appropriated, upon receipt by him of proper vouchers duly authenticated.

Sec. 3. This act shall take effect upon its passage.

This legislation supplements the tax reimbursement payments to West Greenwich on the decreasing formula of 4% per year, instituted in 1967. The town of Coventry also receives payments for the cost of educating children residing in the area affected by the Big-Wood Reservoir Complex, but does not receive any tax reimbursement by the state by virtue of the 25% threshold mentioned above.

6.4.3 Conclusions

In the opinion of the contractor, there is no simple and generally applicable formula for tax reimbursement that can be recommended. From our analysis of the obstacles to successful advance land acquisition, considerations of equity emerge as an important issue. Consequently, it is vital to successful implementation that the donor areas be equitably reimbursed for their tax losses. By equitable we mean that tax reimbursement formulae fixed in advance of acquisition should be rejected in favor of an annual review and determination of tax loss on a case by case basis.

However, there is a practical difficulty to such a suggestion. The donor community may prefer that the formula be fixed in advance, and so written into the legislation; the guarantee of reimbursement so provided being preferable to a more vague promise of annual review. Therefore, while the enabling legislation should allow for annual review, it should also guarantee that in no case would the tax reimbursement be less than the loss at time of acquisition. Even if payments reach the guaranteed minimum, any savings due to diminution of community services are offset by loss of value of the guaranteed minimum payment due to inflation.

Furthermore, the contractor rejects the concept that a certain percentage of assessed valuation must be lost before a town becomes eligible for payments-in-lieu of taxes. The inequity inherent in this idea appears to have been recognized in Rhode Island, and the more recent bills to authorize acquisition of the Nipmuc-Tarkiln reservoir sites deleted this provision.[11]

For similar reasons of equity, it is desirable that the tax reimbursements be done by those who benefit from the use of the tax-exempt site, rather than by state or municipal taxpayers as a whole. Where a water resources project results in a marketable commodity, it is desirable that the price of that commodity should reflect its true cost, and should thus include the cost of tax reimbursement to the donor area unless there is an overriding social objective or government policy that deems a transfer of funds from the donor to receiver area to be desirable. Where water supply is concerned, it follows that the cost of tax reimbursements to the donor community should be borne by the water consumers, and the most logical mechanism for such a proposal is an earmarked surcharge on the price of water. Similarly, where a tax exempt project results in electric power, the price of electricity from that project should include some part of the cost of tax relief, according to the contribution of power benefits to total project benefits. However, this recommendation should be qualified, because some states, such as Connecticut, do not allow water companies to bill their customers for costs of reservoir sites in advance of their actual use as reservoirs. We would suggest that such legislation be changed for the benefit of the entire state.

Where non-marketable benefits result from a water resources project, for example flood control benefits, such an arrangement may be inapplicable.

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[11] Even so, none of these bills passed. See also Section 7.

What would the cost of this surcharge be to the consumer? Data obtained from the assessor in the Town of Burrillville, Rhode Island indicates that the Nipmuc Reservoir would eliminate some $850,000 of assessed valuation, equivalent to a loss of approximately $26,000 per annum. The Woonsocket water supply system serves about 45,000; consequently, the per household cost is about $2.40 per year. This is hardly an unreasonable surcharge to the consumers who benefit by the new reservoir. The principal attraction of such a device is that the costs of providing tax loss reimbursements are reflected in the price to the consumer, rather than borne by taxpayers as a whole. Nevertheless, this payment does not represent the entire cost of advance land acquisition, which would have to be financed by other methods and perhaps supplemented by a small additional surcharge.

6.5 COMPARATIVE ANALYSIS OF SITE PRESERVATION TOOLS

A comparative analysis of the available tools for reservoir site preservation is complicated by the difficulties of undertaking a discretization of the spectrum of urban development. Comparison by reference to a simple development trichotomy of urban, suburban and rural would be a somewhat misleading over-simplification. Therefore, we shall take the approach of defining the optimum application of each tool in terms of idealized land use scenarios. Any real world reservoir site will consist of a mix of these idealized scenarios and consequentLY calls for a mix of tools to preserve the site. Once again, there are no simple answers to the question of which is the best tool for New England.

Acquisition of fee simple is unquestionably the optimum preservation method in areas subject to strong pressures of urbanization, and has been successfully utilized for water resources site preservation.[1] This method has also been successfully used by some of the site preservation programs financed under the HUD scheme.[2] It has the key disadvantage from the viewpoint of the sponsoring agency that funds must be available; and in Rhode Island, for example, it is the absence of funds that have prevented acquisition.

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[1] Olsen reports that Akron, Ohio uses this method for preserving its municipal water supply sites and Pennsylvania in preserving sites in the Delaware valley. (op. cit., p. 43)

[2] See Section 6.2.

A most desirable feature of an outright acquisition approach is a leaseback provision that allows the former owner to continue occupancy of his residence until such time as the project is finally constructed. Outright life tenancy, favored in other preservation programs, is less suitable for reservoir site preservation because eventually the reservoir will be constructed and possibly before life tenancies have expired.

The optimum application of easements for reservoir site preservation is in areas of low development potential -- wetlands, swamps, areas subject to frequent flooding or otherwise unbuildable. In such areas, the cost of the easement (or purchase of development rights) would be considerably less than the fee simple; the property would remain on the local tax rolls and therefore not require a reimbursement to the community.[3]

As noted by Olsen,[4] a possibly major disadvantage to easements is the fact that partial rights generally cease to exist when the need for which they are acquired ceases to exist; and, therefore, unless the acquiring jurisdiction has full title, the public would lose its investment because it has nothing to sell. We have elsewhere advocated a flexible approach to site preservation with a frequent review of the continued need for the site in question. Therefore, where sites needed

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[3] Although if fee simple were acquired, the low development potential would probably imply low assessed value and, therefore, little tax loss would result.

[4] Olsen, op. cit. p. 43.

only in the long-term future are concerned, easements would tend to reinforce the problems of planning inertia as explained in Chapter 4.

With reference to zoning, it is doubtful that municipalities could apply this tool for reservoir site preservation in New England. While cities may be allowed to exercise eminent domain outside of their jurisdiction, extra-territorial zoning is not available as a preservation policy.[5] Consequently, a zoning approach would need to be at a state level. Indeed, it could be argued that basin-wide zoning that may cross the state lines, is the preferable approach, but for practical reasons, the implementation of the zoning would still need to be delegated to the states.

What precedents exist for state-wide zoning? Both Massachusetts and Connecticut have Wetlands Acts that restrict the use of wetlands without automatic compensation. Individual cases in Massachusetts have proved the Acts, insofar as they have been challenged, to be constitutional but have stated that remuneration would be necessary if the restrictions on a particular tract were tantamount to a taking.[6] Zoning regulations similar to various wetlands acts, though few in number in the United States, do indeed require compensation to the landowner as a taking by eminent domain if the landowner can prove he was so restricted, that the restriction or zoning was in effect a taking, and thus he had suffered damage, usually financial loss.

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[5]Few cities in New England have surface water reservoirs within their city limits, and most go beyond to rural towns for their supply.

[6]Commissioner of Natural Resources v. Volpe & Co., 349 Mass. 104, 206 N.E. 2d 666 (1965).

Although there is, to date, no law of any state that allows zoning of land for a future reservoir site, it would follow that such a law or zoning regulation would, as do the Wetlands Acts, require compensation if the landowner could prove he had suffered damage. The criticism of such a law, as is true in the Wetlands Acts, is that the individual landowner does not automatically get reimbursed for financial loss, and must, therefore, go through the timely and costly judicial process and sue the state for damages.

Consequently, although there are advantages to the use of state-wide zoning from the state viewpoint, there are serious inequities involved in such a procedure. Even if not unconstitutional, this approach is regressive in the sense that persons of limited financial means may be reluctant to go to court to obtain reimbursement. In our conclusions of Chapter 8, we shall return to this point and suggest some measures in its resolution.

Finally, there remains the tax policy incentive approach. In the opinion of the contractor, there exists insufficient statistical information to evaluate the actual effect of such measures as opposed to the intended effect. In theory, of course, it is an attractive approach, and many New England states have implemented appropriate measures in efforts to preserve farmland, and several writers have viewed such policies for reservoir site preservation with favor.[7] However, it seems that to work effectively, tax policy

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[7]See e.g., Olsen, op. cit., pp. 48-50 and Section 2.4.

measures must be related to the state-wide zoning approach outlined above. Areas identified as potential reservoir sites would be then eligible for property tax relief. Indeed, such tax relief might even be offered as a quid pro quo for the restrictions imposed by the zoning. But the major difficulty with the property tax incentive approach in New England is that the property tax is administered locally, rather than by the jurisdiction we have recommended to administer the preservation policy, namely the state. Therefore, there may be little incentive on the part of local communities to forego tax revenue, or to raise tax rates in order to keep revenue at a constant level. Note that farmland and open space are distributed more or less evenly over most rural towns, and therefore the impact of tax relief on farmland would be relatively minor. But the potential reservoir sites of a state-wide plan may take in major areas of just a few towns who would very likely object strongly to a reduction in tax revenue.

In summary, we conclude that it is very doubtful that a tax relief policy would be effective in New England for reservoir site preservation. It would only be equitable in the framework of an accepted state-wide zoning plan. If the zoning plan works effectively, the restriction it imposes on land would tend to reduce the market value anyway, and therefore a tax policy measure to achieve what would be the same effect is redundant. Of course, effective tax policies to preserve farmland and open space may indirectly benefit reservoir site preservation, and should, therefore, be supported. However, this is not equivalent to advocating tax relief on only potential reservoir sites.

CHAPTER 7

RHODE ISLAND CASE STUDIES

7.1 INTRODUCTION

The purpose of the case study of this chapter is to illustrate the application of the principles evolved in prior chapters to an actual site preservation planning problem. It will also serve to document many of the major findings of the previous chapters, in particular the conclusion that the major problems are institutional rather than economic or legal. Indeed, we shall attempt to show that it is not difficulties in decision-making relative to timing of acquisition, or choice of preservation tool, that has hindered the implementation of site preservation; rather, problems of communication, information, public predispositions, and perceived inequities are the real barriers.

Section 7.2 will set the background to the problems of water resources planning in Rhode Island, and sections 7.3 through 7.8 will discuss each of the sites of concern. Section 7.9 will focus on the history of recent legislation pertinent to advance acquisition, and 7.10 will be addressed to the problems and obstacles of reservoir site preservation programs and policies of Rhode Island in the light of research conducted as part of this study.

7.2 BACKGROUND TO THE PROBLEMS OF WATER RESOURCES PLANNING IN RHODE ISLAND

A quantitative comparison of population and land area statistics among the states reveals that Rhode Island stands out as having some rather unusual extremes, being the smallest of the fifty in terms of land area, but yet the most densely populated of all. Approximately three-fourths of the State's population is centralized in the metropolitan Providence area with less concentrated pockets of population in the satellite cities of Woonsocket and Newport.

The City of Providence has played a prominent role in the development of water supplies in Rhode Island. As early as 1870, the City began a regional system serving parts of five surrounding communities.[1] Since that time the system has grown markedly, far ahead of the other fourteen major systems in the State. In fact, the Providence water service area in 1969 provided service to approximately 40 percent of the total State land area, more than the combined area served by all other public water supply systems in the State.[2] Furthermore, Providence provides an estimated 60 percent of the total consumption of public water supplies in the State. Presently, all consumers are served from a single source of supply to the Providence system - surface water from the Scituate drainage basin.

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[1]Charles A. Maguire & Associates, Summary Report, A Recommended Program for the Development of the Big and Wood River Reservoirs and Waterworks Improvements for the Providence Water Service Area, prepared for the Providence Water Supply Board (March, 1968), p. 1.

[2]Ibid.

The existing Providence system is estimated to meet the projected demands to the year 1980, but, beyond this time, additional sources will be necessary to augment the Scituate supply. Because the development of groundwater in and around the Providence service area will provide only limited additional supplies, most of the increased demand must be met from surface reservoirs.[3]

The population of the State is expected to increase at about 0.8 percent per annum, as compared to growth rates of 1.0 for Massachusetts, 1.9 for Connecticut, and 0.7 percent for Maine.[4] In 1970, Rhode Island had a total population of 950,000[5], representing a ten percent increase over the 1960 population. Population projections indicate an increase to 1,100,000 by 1990 and 1,400,000 by the year 2020.[6] Similarly, the Providence metropolitan area is expected to rise from 630,000 in 1970 to 770,000 by 1990 and to 980,000 by the year 2020.[7] Based on population projections and water consumption trends, daily use requirements for public water in Rhode Island would rise to 168 mgd in 1990, 66 mgd more than in 1965, and to 242 mgd by 2020.[8]

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[3] Ibid, p. 3, and Metcalf & Eddy, Inc., Report to the Water Resources Coordinating Board, State of Rhode Island, on A Development Plan for the Water Supply Resources of Rhode Island (August, 1967), p. 5.

[4] Maguire, op. cit., p. 19.

[5] Rhode Island Statewide Planning Program, Technical Paper Number 18 (revised), 1970 Census of Population and Housing: Selected Data (July, 1971), p. 14.

[6] Metcalf & Eddy, Inc., op. cit., p. 5.

[7] Ibid.

[8] Ibid.

The dependable yield of all existing public water supply systems in the State was 152 mgd in 1969, and hence an additional 90 mgd would be required by the year 2020.[9] The demand on the Providence system alone during the next fifty years is expected to increase from 53 mgd in 1965 to 140 mgd in 2015[10]; consequently, the existing 72 mgd safe yield from the Scituate system must be approximately doubled by this latter date from new surface sources.

Prompted by this need, the State Water Resources Board has formulated a Statewide Plan for water resources development.[11] This plan calls for a progressively phased program of reservoir construction to provide additional quantities of water to the Providence regional system and the northern area system, in addition to exploring the possible groundwater sources to supply the southeastern area of the State. The expansion of the Providence system calls for a total of four reservoirs: The Big River, the Wood River, the Moosup River, and the Bucks Horn Brook. The Big River facility was originally recommended for completion by the year 1981 and the Wood River Reservoir for completion by 1997.[12] These two facilities will reportedly serve the needs of the Providence water service area until the year 2012, after which the proposed Moosup River flood-skimming operation and the Bucks Horn Brook Reservoir will be required.[13] A 1969 report entitled Plan for the Development and Use of Public

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[9]Rhode Island Statewide Comprehensive Transportation and Land Use Planning Program, Report Number 10, Plan for the Development and Use of Public Water Supplies (September, 1969), p. 66.

[10]Maguire, op. cit., p. 21.

[11]Rhode Island Program, Report Number 10, op. cit., p. 66.

[12]Maguire, op. cit., p. 3.

[13]Ibid, p. 25.

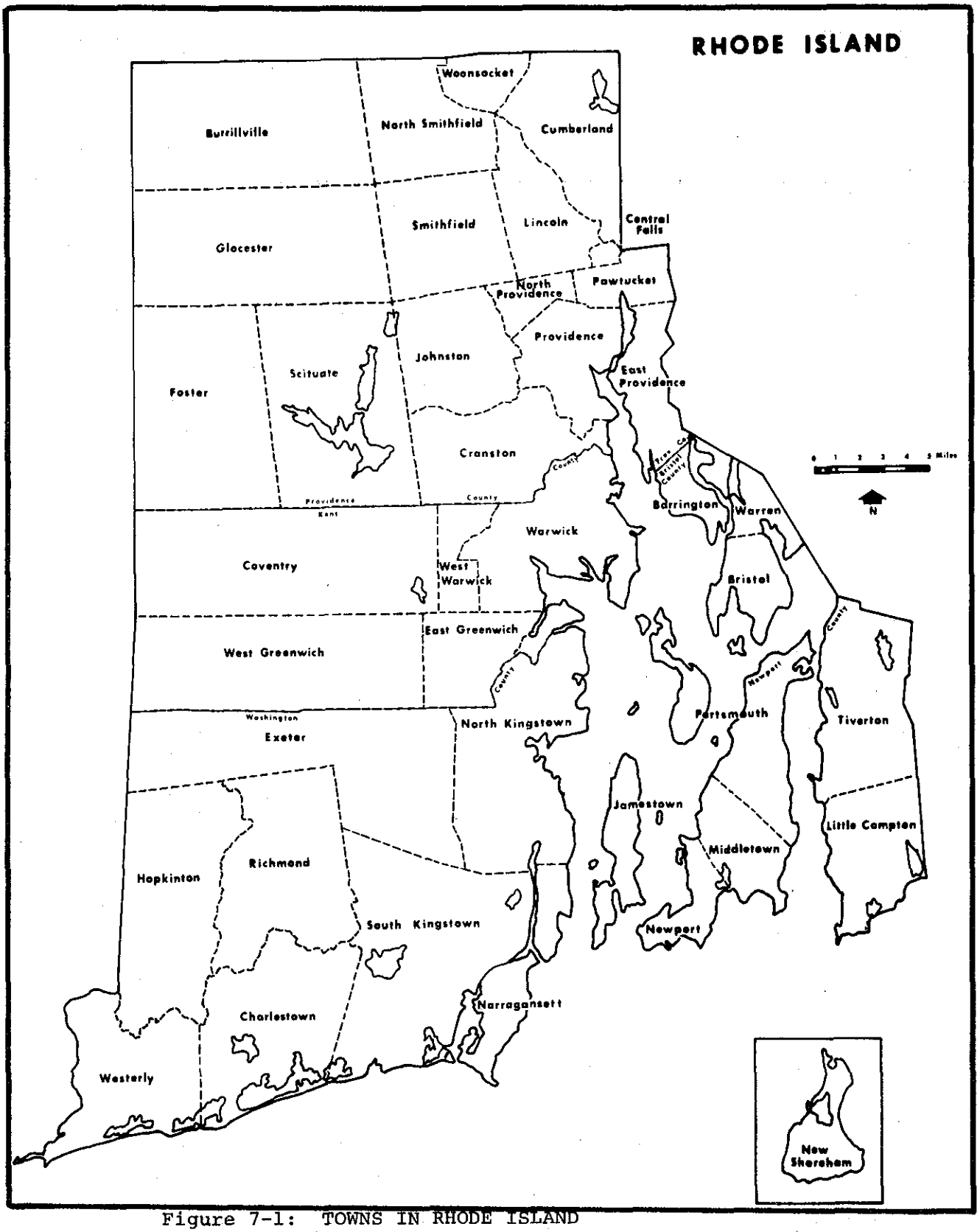

Figure 7-1: TOWNS IN RHODE ISLAND

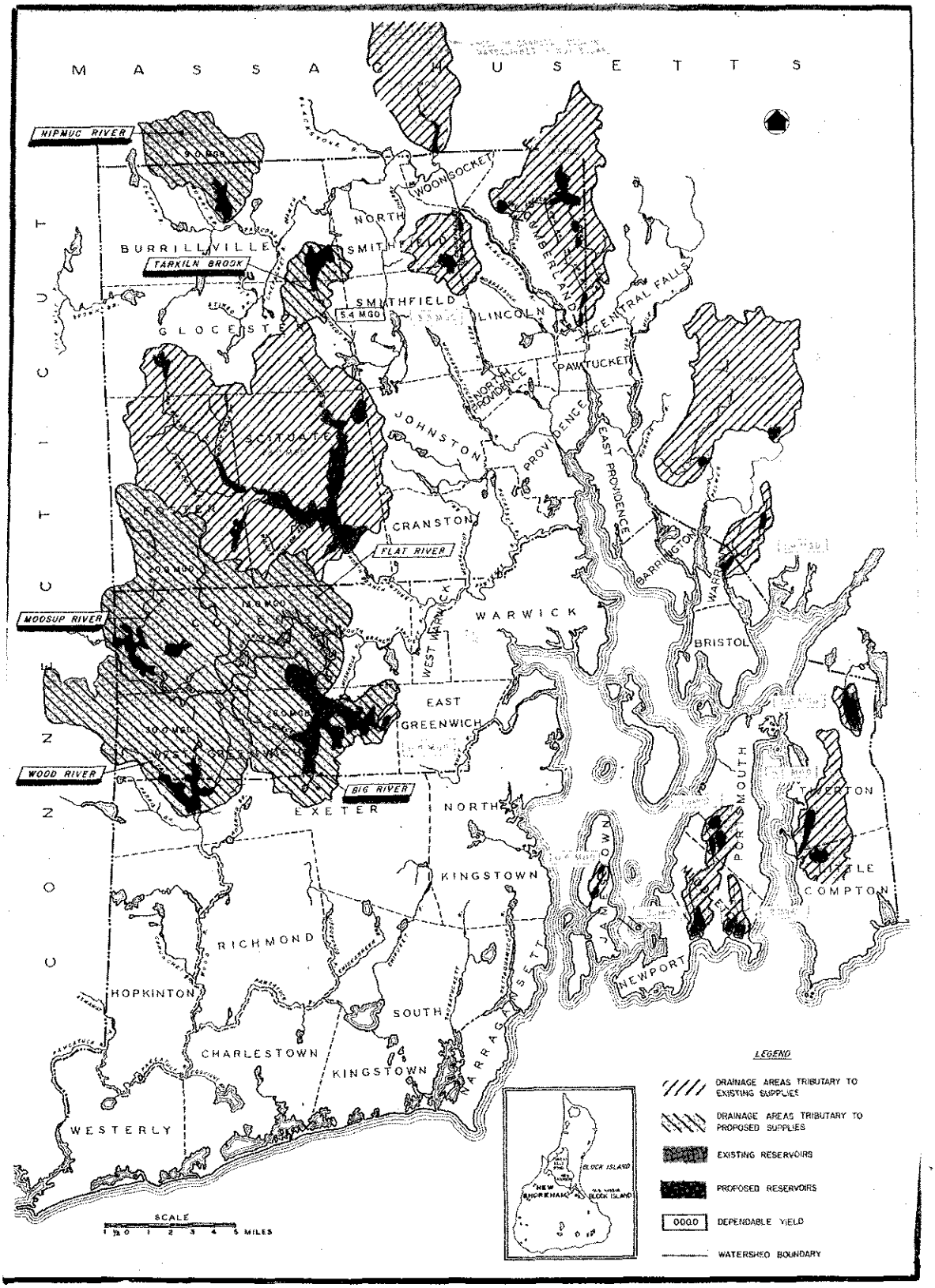

Figure 7-2: LOCATION OF RESERVOIR SITES

(SOURCE: METCALF & EDDY, OP. CIT.)

Water Supplies, by the Rhode Island Statewide Comprehensive Transportation and Land Use Planning Program, recommends that this reservoir complex also serve the southeastern portion of the State, which will face critical water shortages in future years. Because of these imminent shortages, the report recommended that the Wood River facility be developed prior to 1990.[14]

To augment the northern water supply system, whose approximate service area is indicated on Figure 7-2, two reservoirs and a diversion scheme are proposed: the Nipmuc diversion scheme, scheduled for 1995; the Nipmuc River Reservoir, scheduled for 2010; and the Tarkiln Brook Reservoir, scheduled for 1980.

Finally, in southern Rhode Island, two well field sites in the Towns of Richmond and South Kingston have been proposed to meet the growing needs of the south-central area of the State east of Narragansett Bay, as well as the South County area.

The Board has recognized the urgency of preserving these reservoir sites as delineated in the Statewide plans and has initiated legislation authorizing the financing of land acquisition for many years. But, before discussing the problems and obstacles that Rhode Island has faced in its efforts to implement an advance land acquisition program, we turn to a discussion of the individual reservoir sites.

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[14] Rhode Island Planning Program, Report Number 10, op. cit., p. 82.

7.3 WOOD RIVER RESERVOIR

Geographical Location:	Western-central portion of Rhode Island, including portions of the Towns of West Greenwich and Exeter, Rhode Island(see Figures 7-2 and 7-3)
Water Supply System:	Providence Water Supply Board
Drainage Area:	36 square miles
Water Surface Area:	920 acres
Total Storage:	6,000 million gallons
Usable Storage:	4,500 million gallons
Net Dependable Yield:	27.0 million gallons daily[1]

7.3.1 Site Description

Scheduled for completion after the Big River Reservoir, the Wood River Reservoir as planned would augment the capacity of the Providence metropolitan water system well into the 21st century. The proposed reservoir site would cover approximately 4.6 square miles of land and 1.4 square miles of surface water area in the western section of the Towns of Exeter and West Greenwich. The boundaries of the 36-square mile watershed encompass nearly the entire western portion of West Greenwich. The Wood River Reservoir and appurtenant facilities would provide a supplementary source of water to the Big River Reservoir. Impounded flows would be transferred from the site via a 50 mgd pumping station and 4.2 miles of transmission main.

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[1] Metcalf & Eddy, Inc., A Development Plan for the Water Supply Resources of Rhode Island, August, 1967, p. D-12.

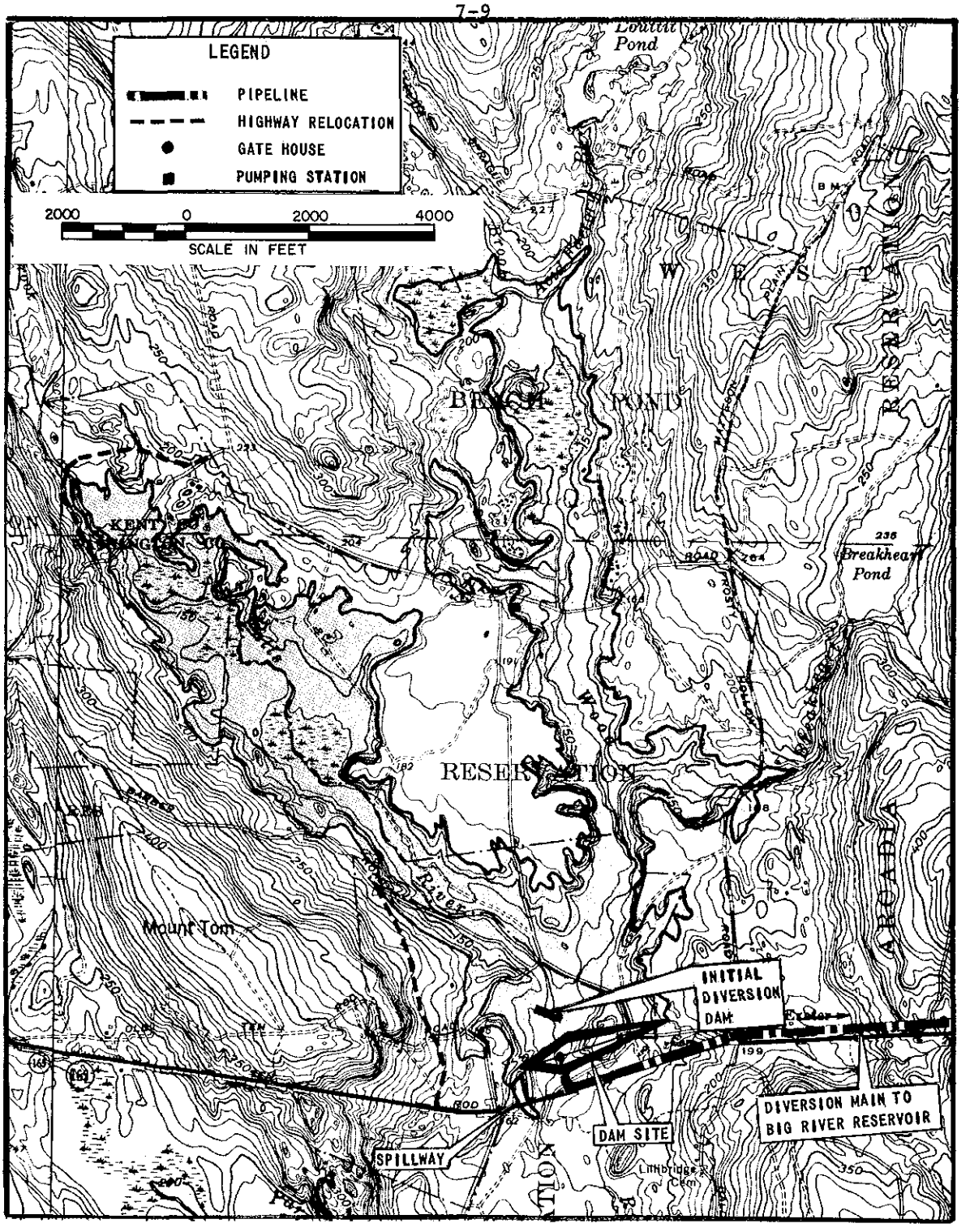

Figure 7-3: WOOD RIVER RESERVOIR
(SOURCE: METCALF AND EDDY, op. cit.)

TABLE 7-1
ESTIMATED COSTS
WOOD RIVER RESERVOIR

PROJECT DESCRIPTION	ESTIMATED COST
50-mgd. pumping station	$1,600,000
4.2 miles of 48-inch transmission main to Big River watershed	2,000,000
Land acquisition and condemnation of structures	($7,500,000 for Big and Wood Reservoirs.)
Clearing and grubbing	447,000
Cemetery relocation	none
Demolition of structures	none
Highway relocation	210,000
Public utility relocation	none
Dams, dikes, and appurtenent works.	2,700,000
TOTAL	$6,957,000

NOTE: Figures represent 1967 construction costs and must be adjusted upward to reflect current cost factors.

Source: Metcalf & Eddy, Inc., A Development Plan for the Water Supply Resources of Rhode Island, (August, 1967), pp. F-10 to 11.

7.3.2 Site Acquisition

Both Exeter and West Greenwich are sparsely settled, with 1970 Town populations of 3,245 and 1,841, respectively. Land in both communities is primarily undeveloped, with isolated sections of rural residential development scattered along arterial roads.

Landtaking for the Big and Wood Reservoir is now essentially complete, although two cases still await litigation. Acquisition for the Wood River project will total 4,400 acres of relatively vacant, undeveloped land, some 90 percent of which was already State-owned prior to acquisition. The latter included ownership by the University of Rhode Island, the State Division of Parks and Recreation, and the State Division of Fish and Game. Designated uses for these State lands were essentially recreation and open space.

Some 450 acres of privately owned land was to be acquired in the Town of Exeter. This land, held in 13 private parcels, was in residential and agricultural use at the time of taking, and only ten residences required condemnation. Several road relocations are planned, but these are secondary roads, and the alternate routes should not cause any great inconvenience. Due to the rural nature of the site area, no public utility or community facilities will need to be relocated.

7.3.3 Impact on Community

The impact of land acquisition on the Towns of Exeter and West Greenwich for the Wood River project has been minimized, with ninety percent of the required land already in public ownership prior to the taking. The conversion of use of the State-owned lands has little, if any, impact on the social or economic structure of the Towns. By and large, the greatest impact would come from tax losses on the 450 acres.

7.4 MOOSUP RIVER RESERVOIR

Geographical Location:	Western-central part of Rhode Island and eastern-central part of Connecticut including portions of the Towns of Coventry, Rhode Island and Sterling, Connecticut (see Figures 7-2 and 7-4)
Drainage Area:	34 square miles
Water Surface Area:	735 acres
Total Storage:	- - -
Usable Storage:	- - -
Net Dependable Yield:	12 million gallons daily[1]

7.4.1 Site Description

The Moosup River project was originally planned by the Soil Conservation Service for flood control. Under current proposals, the reservoir would be additionally utilized to augment the supply of the Big River Reservoir. Sponsors for the project include: Rhode Island and Connecticut, the Environmental Protection Agency, the Rhode Island Department of Natural Resources, and the Rhode Island Water Resources Board.

The Moosup River Diversion Reservoir is recommended as the third stage in a water resources development program to be preceded by the construction of the Big and Wood River facilities. Based on projected demand factors, the Moosup River facility should be constructed by the year 2012.

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[1] Metcalf & Eddy, Inc., op cit., p. D-12.

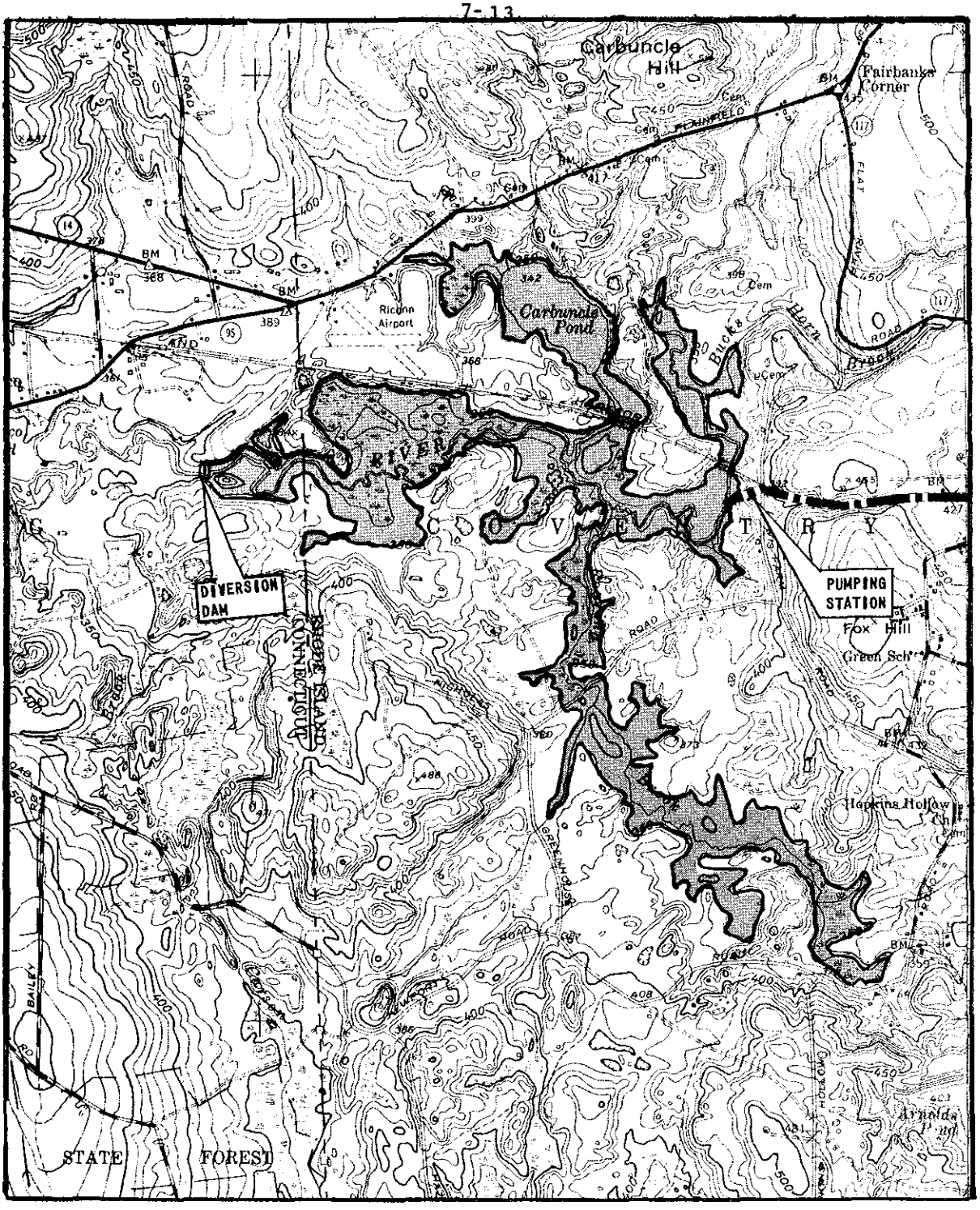

Figure 7-4: MOOSUP RIVER RESERVOIR
(SOURCE: METCALF AND EDDY, Op. Cit.)

TABLE 7-2

ESTIMATED COSTS
MOOSUP RIVER DIVERSION RESERVOIR

PROJECT DESCRIPTION	ESTIMATED COST
Increase height of U.S. Soil Conservation Service Flood Control Dam by six (6) feet to allow for pumping from reservoir.*	$100,000
40 mgd. pumping station	700,000
Six (6) miles of 48-inch transmission main to Big River watershed.	2,900,000
TOTAL	$3,700,000

NOTE: Figures represent 1967 construction costs and must be adjusted upward to reflect current cost factors.

Source: Metcalf & Eddy, Inc., Development Plan for the Water Supply Resources of Rhode Island, (August, 1967), p. F-10.

*Metcalf and Eddy decision, absent approval of SCS.

The Moosup watershed includes the Town of Sterling and portions of the Towns of Plainfield and Killingly, Connecticut, as well as portions of the Towns of Coventry, Foster, and West Greenwich, Rhode Island.

The proposed reservoir is to be located at the western edge of the Town of Coventry, bordering on the Connecticut line; surface water would cover 735 acres, most of which is in the Town of Coventry, while the dam structure would be located just over the line in Sterling, Connecticut. Seasonal flood waters would be diverted to the Big River Reservoir via a 40 mgd pumping station and six miles of forty-eight inch transmission main. Impounded water would be flood-skimmed during times of excess runoff and diverted to the Big River Reservoir for storage and use.[2]

7.4.2 Site Acquisition

Nine hundred acres are designated for acquisition, of which 735 acres would be flooded. Relatively small peripheral land takings would afford limited protection against potential pollution emanating from abutters. Much of the land to be

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[2]Charles A. Maguire & Associates, Summary Report, A Recommended Program for the Development of the Big and Wood River Reservoirs and Waterworks Improvements for the Providence Water Service Area, prepared for the Providence Water Supply Board, (March, 1968), p. 28.

taken is presently vacant. The lower lying areas are subject to excessive flooding during periods of heavy precipitation and during spring runoff.

In 1965, the Town of Coventry designated the subject area as a conservation and protection area. Such recommendations, even though they are recreation and stream protection oriented, are quite compatible with the state's overall intended purpose and use of the site for flood protection and water supply.[3]

Within the site area are some ten to fifteen residences, several tracts of agricultural land, private- and state-owned recreational lands, a railroad right-of-way, and a small airport.[4] In view of the limited existing development and limited potential development due to drainage conditions, preservation of the site for future flood control and municipal water uses should meet minimal opposition. The flood prevention structure does not call for acquisition of residences.

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[3] Rhode Island Development Council Planning Division, Community Assistance Program, Comprehensive Community Plan, Coventry, Rhode Island, (1966), Recreation and Conservation Map.

[4] Rhode Island Development Council Planning Division, Community Assistance Program, Town of Coventry, Planning Analysis Comprehensive Plan Report #1 (April, 1964), Generalized Land Use.

Over ninety percent of the Town of Coventry is zoned for residential land use. Of this land, most is classified as low density, i.e., two families or less per acre. In order to discourage development of the site area and to assist in preservation of the area through land use controls, the town could take the necessary steps to establish a conservancy zone or a very low density residential category, thereby inhibiting land speculation and encroachment.

7.4.3 Impact on Community

The Town of Coventry is not only rich in water resources, but also endowed with certain natural and topographical conditions suitable for reservoir sites. In addition to the existing Flat River Reservoir in the eastern portion of Coventry, the planned Moosup River, Big River, and Bucks Horn Brook Reservoirs would also be located in Coventry. Completion of all proposed facilities will have a significant impact on the physical, social, and economic structure of the community.

As lands are acquired for the improvements, a significant portion of the community's real property will fall into either a low assessment or tax exempt classification, depending on the type of acquisition method used. However, the vacant, unused land and wetlands prone to flooding, which normally carry a low assessment because of their unsuitability for development purposes, yield little to the tax base.

Legilation for acquisition of the Moosup site will probably be submitted to the General Legislature by the Rhode Island

Department of Natural Resources. As discussed in Section 7.8, most of the bills submitted for land acquisition by the Water Resources Board have incorporated provisions for tax relief based on a decreasing four percent per annum formula over a twenty-five year period. No legislation has been drafted as yet by the Department of Natural Resources, hence, no tax relief policies have been established.

The Department of Natural Resources is reportedly considering the purchase of flood easements on a number of parcels in the site area, rather than outright purchase of fee simple. Using easements as an alternative in acquisition practices is generally more acceptable and more favorably received by the landowner, who is allowed to own the property but sacrifices certain development rights for a consideration. Easements seem to work well on lands having little value for development because of physical limitations, e.g., drainage, ledge and excessive slope. Due to the vulnerability of flooding in the site area, the technique of easements may be utilized successfully and at less cost to the State. The cost of obtaining easements on land suitable for development is generally prohibitive.

When easements are used, the land remains on the tax rolls, although probably at a reduced valuation since the owner has foregone some of his rights to the land. This obviates the need for the State to provide tax relief. Since land acquisition for the Moosup facility is a few years away, it is difficult to assess tax impact using the current figures and tax structure. As noted in Chapter 4, local property taxes may become less of a proportionate part of local revenues in the near future. Less reliance on the property tax

as a source of revenue for operation of local governments would correspondingly reduce the interim financial impact in communities where reservoir acquisition is proposed.

Land has already been acquired in Coventry for the Big River Reservoir. Although legislation for those takings did not provide direct local tax relief, the State will pay to the town an annual per pupil stipend for those children still residing in the acquisition territory.

Assets to the town which are associated with the Moosup and other reservoir projects are mainly increased recreational facilities (perhaps appreciating surrounding property values) and assurance of permanent open space. Flood control in the case of the Moosup project would not be a benefit to the Town of Coventry. Only downstream Connecticut towns will receive flood benefits. Overall these features should be viewed from the perspective of regional benefits.

Only minor utility acquisition will be required for the Moosup Project. The New Haven Railroad right-of-way crosses the site in two places, but since it is abandoned, no relocation is necessary. Only one secondary road carrying east-west traffic need be discontinued. Thus, the proposed reservoir does act as a physical barrier to possible future transportation routes but at present would create little disruption to other existing forms of public utilities and services. The reservoir will also pose as an effective barrier to development. Growth and development forces pushing westward would be impeded from extending over and continuing on the other side of the reservoir. Installation of public utilities would, likewise, be rather costly to extend into the western side of the reservoir.

7.5 BUCKS HORN BROOK RESERVOIR

Geographical Location:	Part of Coventry, Rhode Island (see Figures 7-2 and 7-5)
Water Supply System:	Providence Water Supply Board
Drainage Area:	4.1 square miles
Water Surface Area:	500 acres
Total Storage:	2,400 million gallons
Usable Storage:	1,800 million gallons
Net Dependable Yield:	3.0 million gallons daily[1]

7.5.1 Site Description

The Bucks Horn Brook project is proposed as a flood-skimming reservoir operating in conjunction with the Moosup River works. Flood flows would be pumped from the Moosup Reservoir to the Bucks Horn Reservoir, then pumped again from Bucks Horn to the Big River Reservoir. It is estimated that the Bucks Horn Brook project will be required to meet future water supply needs beyond the year 2018. This facility is the last link in the progressively phased long-range planning program to increase supplies to the Providence regional system by 2020.

The reservoir site, as proposed, is to be situated in the central-western section of the Town of Coventry. The reservoir watershed is small in comparison with storage capacity. The excess storage is to hold peak seasonal flows

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[1] Metcalf & Eddy, Inc., Report to the Water Resources Coordinating Board State of Rhode Island on A Development Plan for the Water Supply Resources of Rhode Island (August, 1967), p. D-12.

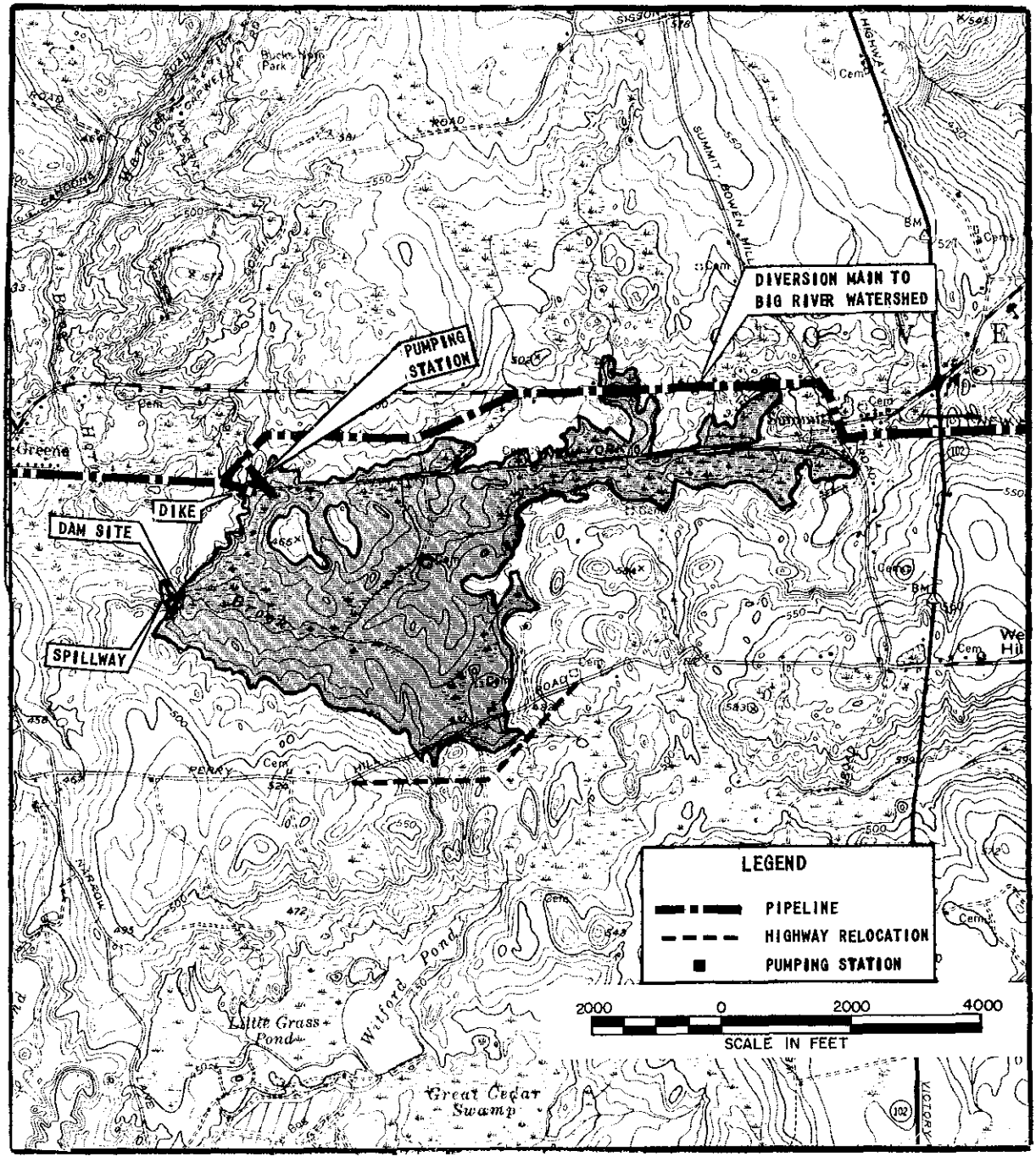

Figure: 7-5: BUCKS HORN RESERVOIR
(SOURCE: METCALF AND EDDY, Op. Cit.)

TABLE 7-3

ESTIMATED COSTS
BUCKS HORN BROOK RESERVOIR

PROJECT DESCRIPTION	ESTIMATED COST
Land acquisition	$390,000
Condemnation of structures	228,000
Clearing and grubbing	240,000
Cemetery relocation	96,000
Demolition of structures	7,000
Highway relocation	120,000
Public utility relocations	25,000
Dams, dikes, and appurtenent works	658,000
60 mgd. pumping station at Bucks Horn Brook Reservoir	530,000
0.2 miles of 48-in. pipe to Moosup River diversion main	90,000
40 mgd. addition to Moosup River pumping station	505,000
TOTAL	$ 2,889,000

NOTE: Figures represent 1967 construction costs and must be adjusted upward to reflect current cost factors.

Source: Metcalf & Eddy, Inc., A Development Plan for the Water Supply Resources of Rhode Island, (August, 1967), p. F-10.

diverted from the Moosup River. As proposed, the system will have transmission mains and pump capacity to deliver flood flows to 80 mgd from the Moosup River to Bucks Horn Reservoir and 60 mgd from there via a forty-eight inch transmission line to Big River Reservoir.[2]

7.5.2 Site Acquisition

Being the last in a series of proposed structures designed to augment water supplies to the Providence regional system places a greater emphasis on the need for site preservation, since construction is not planned until around 2020.

Because the facility is still in the early planning stages, the actual acquisition area has not been delineated as yet. Additional land area in excess of the 500 surface water acres will certainly be necessary to afford a sufficient degree of protection to the water supplies which are to be stored in the reservoir.

There are approximately ten residential dwellings in the site vicinity. A substantial portion of the site is classified as swampland. The right-of-way of the New Haven Railroad passes through the northern perimeter of surface water area. The village of Summit is located at the eastern tip of the proposed reservoir. Future growth of this village will certainly have an impact on the proposed site.

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[2]Metcalf & Eddy, Inc., op cit., p. D-11.

In view of the long-range implementation schedule for this facility, effective land use controls are necessary now, especially in order to assure reasonable future land acquisition costs. A multi-faceted program of negotiated easements, first options to purchase, conservancy zoning, and extreme low density zones would aid in site preservation and minimize later acquisition costs.

7.5.3 Impact on the Community

Most of the proposed reservoir land is privately owned. Since the site is predominantly swampy and has little value for development of any kind, the land produces little in the way of tax revenues for the Town.

At present, very few families will require relocation. If the acquisition technique of easements is utilized, relocation problems would be diminished even further; however, interim growth could make relocation a significant problem in the absence of adequate controls.

The major utility modification required is relocation of 6,000 feet of New Haven Railroad lines.[3] A 4,000 foot realignment of Perry Hill Road would also be necessary, and several cemeteries would need relocation as well.[4]

For the most part, the proposed facility would not act as a physical barrier to development due to the configuration of of the surface water area lying between the two east-west arterial roads. Since the area is wet and poorly drained,

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[3] Metcalf & Eddy, Inc., op. cit., Figure D-2.

[4] Ibid.

the proposed reservoir is little more of an obstruction to surrounding development than are the prevailing physical conditions.

7.6 NIPMUC RIVER RESERVOIR

Geographical Location:	Northwestern Rhode Island, including portions of the Town of Burrillville, Rhode Island (see Figures 7-2 and 7-6)
Water Supply System:	Northern area system
Drainage Area:	16.6 square miles
Water Surface Area:	440 acres
Total Storage:	2,600 million gallons
Usable Storage:	1,950 million gallons
Net Dependable Yield:	9.0 million gallons daily[1]

7.6.1 Site Description

The Nipmuc River project , in conjunction with the proposed Tarkiln Brook Reservoir, would increase water supply to the northern portions of Rhode Island and the northern Providence metropolitan area. Initially, flood flows would be pumped directly from the Nipmuc River to the Tarkiln Brook Reservoir for storage and perhaps treatment prior to distribution. This phase would basically involve flood-skimming of water during seasonal periods of high run-off, with the transmission facility being designed so as to accomodate the ultimate developed capacity of the Nipmuc supply resource on a permanent basis. Later, a reservoir would be constructed on the Nipmuc River to provide year-round diversion to the Tarkiln. This diversion facility at the Nipmuc River is scheduled for construction in the year 1995, with construction of the impoundment some fifteen years later.

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[1] Metcalf & Eddy, Inc., Report to the Water Resources Coordinating Board, State of Rhode Island, on A Development Plan for the Water Supply Resources of Rhode Island (August, 1967), p. D-12.

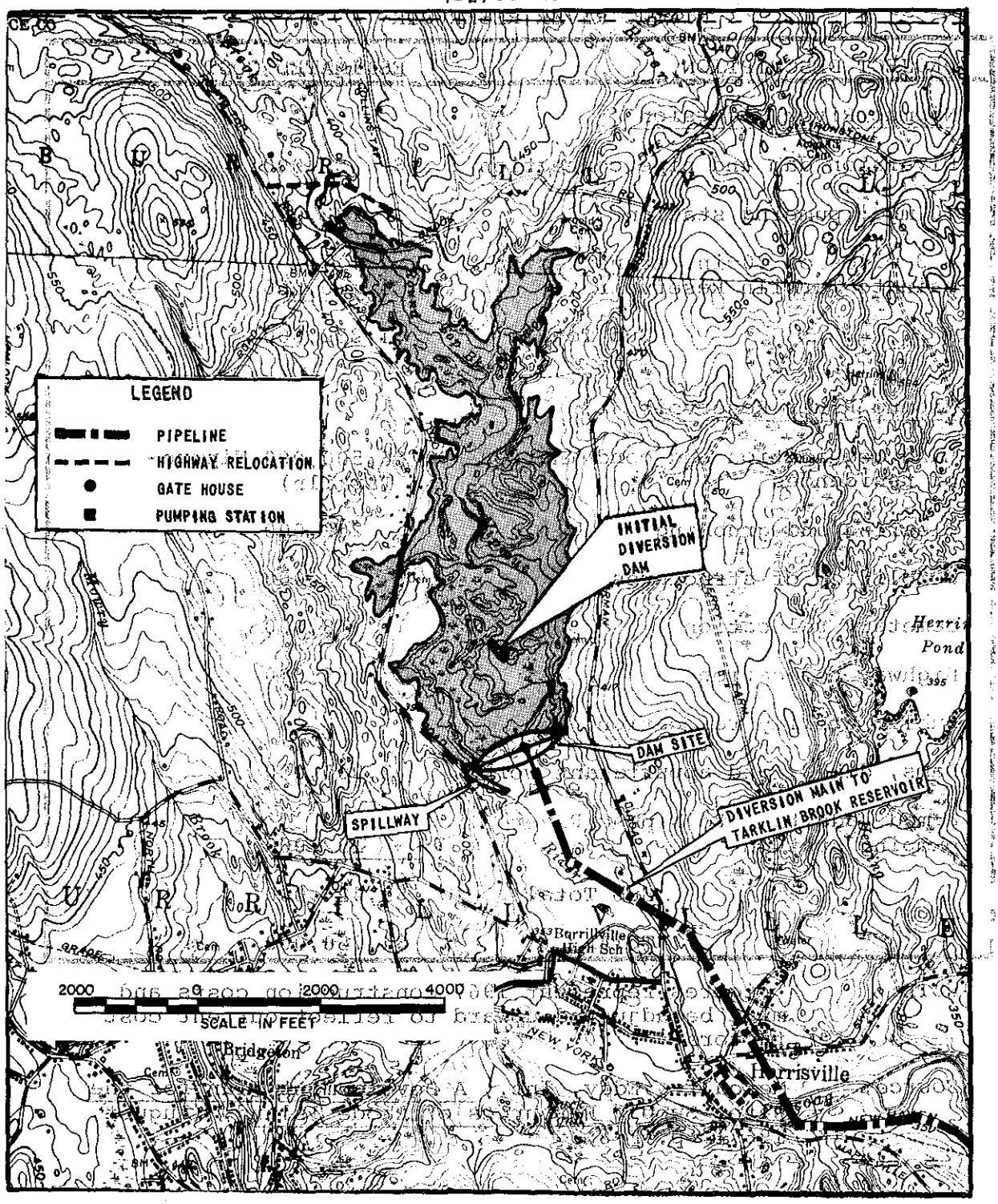

FIGURE 7-6: NIPMUC RIVER RESERVOIR

(SOURCE: METCALF & EDDY, OP. CIT.)

TABLE 7-4

ESTIMATED COSTS
NIPMUC RIVER RESERVOIR

PROJECT DESCRIPTION	ESTIMATED COST
Nipmuc River Diversion	
Diversion dam and pipe connection	$ 50,000
10 mgd. pumping station	172,000
4.3 miles of 30-in. transmission main to Tarkiln Reservoir	1,110,000
Sub Total	$1,332,000
Nipmuc River Reservoir	
Land acquisition and condemnation of residences	($6,500,000 Nipmuc-Tarkiln)
Clearing and grubbing	202,000
Demolition of structures	7,000
Cemetery relocation	48,000
Highway relocation	65,000
Public utility relocation	50,000
Dams, dikes, and appurtenant works	2,900,000
8 mgd. addition to Nipmuc River pumping station	152,000
Sub Total	$3,424,000
TOTAL	$4,756,000

NOTE: Figures represent 1967 construction costs and must be adjusted upward to reflect current cost factors.

Source: Metcalf & Eddy, Inc., A Development Plan for the Water Supply Resources of Rhode Island, (August, 1967), p. F-8.

The site for the proposed reservoir is in the Town of Burrillville, Rhode Island. According to the plan, the reservoir would cover 440 acres. The watershed extends into the Town of Douglas, Massachusetts, and, of the 3,290 total acquisition acres, about 430 were originally planned to be taken there[2] but this plan has been revised so that all lands to be acquired would lie within the State of Rhode Island.

7.6.2 Site Acquisition

The Town of Burrillville recorded a 1970 population of 10,087.[3] Projections indicate that Burrillville is increasing at a rather slow but steady pace and is expected to reach a population of 14,000 by the year 2020.[4] The Town is endowed with a vast amount of open space, with 26,000 out of 36,864 acres classified as undeveloped. Conservation uses comprise 6,047 acres of mostly large tracts of government and privately-owned lands, while agricultural usage totals 1,865 acres.[5]

Of the land to be acquired, approximately 3,000 acres are relatively undeveloped rural land, with scattered residential dwellings along the road system interspersed by agricultural uses in the backlands. There are approximately forty residential structures at present which would either be relocated or razed to allow for the construction and filling of the reservoir at some future date.

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[2]State of Rhode Island House Bill Number H-1722, The General Assembly, January Session of 1971.

[3]United States Census, Population and Housing 1960-1970.

[4]Metcalf & Eddy, Inc., op. cit., p. B-3.

[5]Rhode Island Development Council Planning Assistance Program, Comprehensive Community Plan, Burrillville, Rhode Island (October, 1966), pp. 12-13.

Most privately owned parcels are about thirty acres in size; in total, these private properties are assessed at approximately $900,000.[6]

Currently, the entire site in Burrillville is zoned as an "F" - Farming District, allowing single family detached dwellings on a minimum of one-acre lots.[7] A comprehensive plan prepared for Burrillville in 1966 recommended that lands in the proposed Nipmuc site area be designated "rural density," in order to preserve the rural open space characteristics. In such areas the density should not exceed one family per five acres of land.[8] Implementation of the zoning proposal would undoubtedly be beneficial in preventing intensive development in the site area.

7.6.3 Impact on the Community

Controversy has arisen concerning the Nipmuc and Tarkiln projects; deep-rooted opposition has emanated from the local residents, while the general public in the Providence area has adopted an attitude of indifference toward the project simply because they will not receive any direct benefit from this facility. The latter citizenry are not in favor of supporting bond issues or expending tax dollars to aid another section of the State.

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[6]Data compiled by State Senator James C. Maher of Burrillville, District 27, and Thomas Mainville, Town Clerk, Burrillville.

[7]Zoning Ordinance, Town of Burrillville, Rhode Island.

[8]Rhode Island Development Council Planning Assistance Program, op. cit.

If the Nipmuc area were acquired, then in addition to other State-owned lands in the Town the State would own over one-sixth the Town of Burrillville. Collectively, these State-owned lands do have a significant impact on the community, whereas individually the loss or effect is not very substantial. To lessen the impact of tax revenues lost to the local community, the legislation has included provisions, beginning in 1967, for reimbursement payments equal to property taxes received the year previous to acquisition that would last for a period of twenty-five years, decreasing four percent each year.

The relocation of families in the Nipmuc area is a problematical issue due to the large number of families involved. If the previous owners of the properties were allowed to remain on the land after acquisition, at a small rental fee pending actual construction, sufficient time would be alloted to the property owner to make plans for relocation. It has been found that, when such is the case, the older residents living in what might be called homesteads desire to remain as long as possible on the property, while the younger people desire to re-establish themselves immediately.

The flooded area of the proposed facility is to be located between two north-south State number routes, Round Top Road (Route 96) and Sherman Road (Route 98). As shown in the plan diagrams, the water line is only to touch Round Top Road at the dam site and to cross under it a little to the north of the site.[9] In spite of the fact that Round Top Road is not to be inundated with water, a significant length is included in the acquisition area. Nevertheless, the scheme does not call

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[9]Metcalf & Eddy, Inc., op. cit., Figure D-5.

for relocation of this road, and only a part of Brook Road (between Round Top Road and Collins Taft Road) is to be relocated. If this is the case, and the road is to remain open, the circulation system will be little affected by the installation of this facility. A few roads and several cemeteries would be relocated, as well as certain public utilities.

The Burrillville-Douglas area is experiencing only a slow rate of growth, caused to some degree by the lack of employment opportunities in the local area, coupled with the distance factor between either Worcester or Providence and the area. Current reconstruction of Route 146, between Providence and Worcester, plus the completion of I-52 from the Massachusetts Turnpike to Worcester, could stimulate certain growth in this area. Preservation of the rural character of the Town and the lower land costs are attractive to many families who now live in the urban or urban-suburban area. Such forces of growth that do exist in this area seem to be in a north-south axis, and the configuration of the reservoir is generally parallel to this orientation; as such it does not act as a deterrent to the growth pattern.

The positive attributes of the project are for the most part manifest in the points already discussed in earlier case studies. In consideration of the other recreational assets, Burrillville should perhaps investigate the possibility of developing and promoting a recreation and tourism attraction to supplement their commercial and economic base.

7.7 TARKILN BROOK RESERVOIR

Geographical Location:	Northwestern Rhode Island, including parts of the Towns of Burrillville and Gloucester
Water Supply System:	Northern area system
Drainage area:	16.6 square miles
Water surface area:	660 acres
Total storage:	3,100 million gallons
Usable storage:	2,320 million gallons
Net dependable yield:	5.4 million gallons daily[1]

7.7.1 Site Description

The Tarkiln Brook Reservoir would supplement water supply to eight communities in the northern region of Rhode Island. As proposed, the Tarkiln Brook Reservoir and appurtenant facilities would impound water from Tarkiln Brook, Paine Brook, and other tributaries in the 16.6 square mile drainage basin. In addition, the reservoir would serve as a storage and treatment facility for the interim storage of waters diverted from the proposed Nipmuc River facilities. The Tarkiln Brook project is proposed for construction by the year 1990; however, treatment of the water prior to distribution is anticipated. If the surrounding Nipmuc and Tarkiln site areas remain undeveloped, only partial treatment will probably be necessary.

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[1] Metcalf & Eddy, Inc., A Development Plan for the Water Supply Resources of Rhode Island (1967), p. D-12.

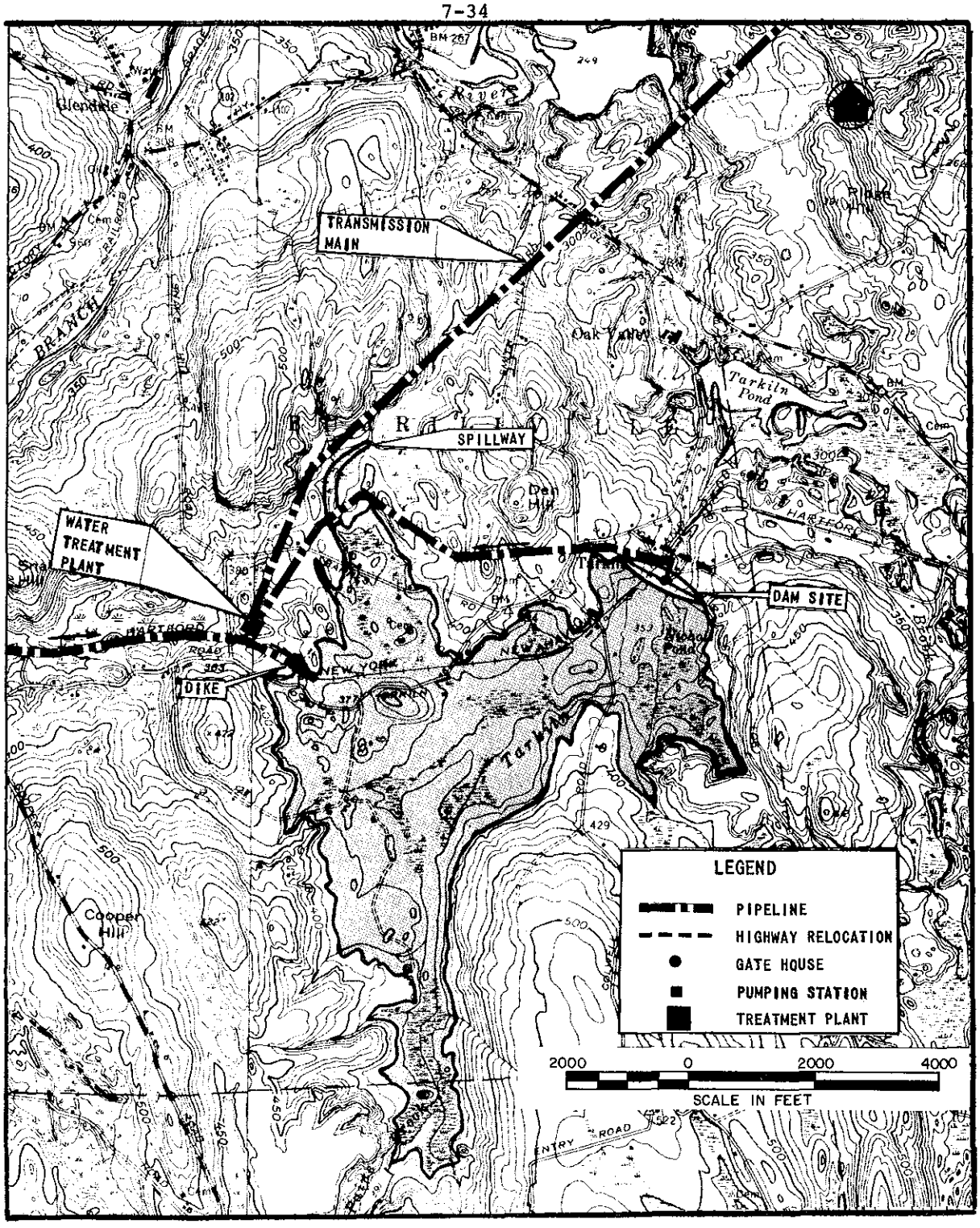

Figure 7-7: TARKILN BROOK RESERVOIR
(SOURCE: METCALF AND EDDY, OP. CIT.)

TABLE 7-5

ESTIMATED COSTS
TARKILN BROOK RESERVOIR

PROJECT DESCRIPTION	ESTIMATED COST
Tarkiln Brook Reservoir	
Land acquisition and condemnation of residences	($6,500,000 Nipmuc-Tarkiln)
Clearing and grubbing	$ 312,000
Demolition of structures	6,000
Cemetery relocation	24,000
Highway relocations	31,000
Public utility relocations	25,000
Dams, dikes, and appurtenant works	950,000
20 mgd. pumping station	340,000
1.5 miles of 30-inch transmission main from Tarkiln Reservoir to water treatment plant	400,000
15 mgd. peak capacity water treatment plant at Tarkiln Reservoir	2,200,000
Transmission mains-6.1 mi. 36-in. main; 3.2 mi. 30-in. main; 1.5 mi. 24-in. main.	3,090,000
Sub Total	$ 7,378,000
Effect of Nipmuc Reservoir	
15 mgd. peak capacity addition to Tarkiln water treatment plant	$ 1,900,000
Sub Total	$ 1,900,000
TOTAL	$ 9,278,000

NOTE: Figures represent 1967 construction costs and must be adjusted upward to reflect current cost factors.

Source: Metcalf & Eddy, Inc., A Development Plan for the Water Supply Resources of Rhode Island, (1967) pp. F-7-8.

7.7.2 Site Acquisition

The site for the Tarkiln Brook Reservoir is predominantly in the Town of Burrillville, with a small part extending into the Town of Gloucester. Acquisition would total 1,680 acres, 660 acres of which would be inundated.[2]

The major types of land uses occurring in the proposed Tarkiln Brook Reservoir are recreational, institutional, agricultural, and residential.[3,4] Aside from the vacant land category, which comprises the majority of the site, agricultural cropland, associated with a number of medium size farms, is the next most extensive use, followed by several large tracts of recreational-type properties, including a golf course, a Girl Scout camp, and a sportsmen's club. Residential uses scattered along the road system account for the third largest category of land uses.

In Burrillville, the site is zoned either as "F" - Farming District, permitting single family homes on a minimum of one-acre lots, or "R-20" district, where the minimum lot size permitted is 20,000 square feet.[5] Land use plans for Burrillville designate most of the site as "rural density" (one family per five acres). The Gloucester portion of the site is designated as

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[2]State of Rhode Island House Bill Number H-1722, The General Assembly, January Session of 1971.

[3]Rhode Island Development Council Planning Assistance Program, Comprehensive Community Plan, Burrillville, Rhode Island (October, 1966).

[4]Rhode Island Development Council, Land Use Analysis, Town of Gloucester (1962).

[5]Zoning Ordinance, Town of Burrillville, Rhode Island (1969).

recreational and as "low density residential," or one family per acre. Since much of the site land is either agricultural or vacant and is zoned for ½ acre lots, the land is highly susceptible to speculation and development. Accordingly, it is necessary, at least as an interim measure, to amend the zoning to one acre or more to help preserve the site.

7.7.3 Impact on the Community

The Tarkiln Reservoir, combined with the proposed Nipmuc Reservoir, would result in the loss of 4,700 acres to the local tax rolls. In addition to this, the local economy is affected by the loss in productivity from a golf course, a scout camp, a sportsmen's club, agricultural croplands, and the like.

Portions of the planned flood area in the Town of Gloucester are poorly drained. The loss of these lands would therefore have a negligible effect on land-use patterns in Gloucester.

An important aspect of the Nipmuc and Tarkiln facilities is that they are designed to provide direct benefit to the local northern area communities where they are located. Nevertheless, local opposition to acquisition of both these facilities has been very strong. Legislative bills for acquisition of the Nipmuc-Tarkiln Brook sites have contained provisions for tax relief in the form of State payments to the community in lieu of taxes lost. Reference is made to the Nipmuc case study section and to section 7.9 for a more detailed discussion of this matter. Many of the implications of the tax immunity have been discussed in the previous case studies and will not be here reiterated.

At the present time, approximately forty families would need relocation to implement this project as planned. Problems of relocation in this instance are similar to those expressed in other case studies and in chapter 5 of this report.

The roads affected by the facility are classified as local roads and serve mostly locally oriented traffic to abutting properties. Two local east-west traffic routes would be cut off by the reservoir, as well as one local north-south route. In accordance with the plan, 6,000 feet of the New Haven Railroad line would need to be relocated.

Because of its small size and isolated location in the corner of the community, the proposed facility does not appear to offer significant impediments to development in the surrounding area. In fact, the location obviates the need for the Town to provide community services to this area.

The citizens of the Town of Burrillville have vigorously opposed the proposed acquisition of both the Nipmuc and Tarkiln sites for a variety of reasons. One of the major arguments stressed by the local citizens has been the lack of a demonstrable need for such a facility now and in the foreseeable future. From their point of view, the Town of Burrillville and the individuals in the acquisition area would be making an unwarranted sacrifice for a facility whose absolute need was questionable. Furthermore, it is their contention that the State would be consuming vast amounts of land and precious natural resources in a community where the State already owns over 3,300 acres. They also contend that the taking would cause an economic hardship on the Town, while simultaneously diminishing the advocacy and preservation of the "home rule"

doctrine. Prolonged delays in commencing development in the Big and Wood sites, as well as insufficient payment in lieu of taxes and other concessions for sustained losses were cited as arguments against construction of the facility. Private property owners stated that they would be willing to support the proposed facilities if they could be convinced that the need was unequivocally absolute and justified. Any slight degree of skepticism on the part of the local citizens or landowners as to actual need generates a solid reaction to oppose the project until convinced otherwise. To overcome the local resistance and Statewide indifference to the Nipmuc and Tarkiln sites will require a concerted education program by the water resource planners, designed to inform the people of the necessity of acquiring the sites and gaining acceptability for the projects; the task will not be easy.

7.8 GROUNDWATER SITE CASE STUDY

Geographical Location:	Upper Pawcatuck River Drainage Basin A. Heaton Orchard-Town of Richmond, Usquepaug-Queen River Watershed B. Liberty Lane-Town of South Kingston, Chipuxet River Watershed
Water Supply System:	Southern area and south-central area
Dependable Yield:	25 million gallons daily[1]

7.8.1 Description

The upper Pawcatuck River Basin is a seventy square mile area in south-central Rhode Island consisting of broad, rolling hills and narrow valleys in the north, with flat-floored plains in the south. It is drained by the Pawcatuck River and its two major tributaries, the Usquepaug-Queen River and the Chipuxet River.[2] Two groundwater reservoirs exist in the outwash deposits of this drainage basin and are capable of producing substantial yields of groundwater. In each of these general aquifer locations, a well field is contemplated to provide water supplies to meet the growing needs in the south-central area of the State east of Narragansett Bay, as well as South County area.

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[1] William B. Allen, Glenn W. Hahn, and Richard A. Brackley, Availability of Groundwater, Upper Pawcatuck River Basin Rhode Island, Geological Survey Water Supply Paper 1821, prepared in cooperation with the Rhode Island Development Council and the Rhode Island Water Resources Coordinating Board (United States Gov. Printing Office, Washington: 1966), p. 1.

[2] Ibid.

7.8.2 Site Acquisition

Land acquisition is minimal in groundwater development because of the small parcels of land that are necessary, normally a minimum of twelve acres. On the other hand, only certain sections of the State contain sub-surface aquifers suitable for exploration for municipal water supply purposes. Recharge of the aquifer is derived from precipitation; from movement of water from surrounding uplands and from infiltration from the streams flowing across the groundwater reservoirs. Precipitation, however, is often diverted to stormwater collection facilities, in developed areas, where it is discharged to the river and not recharged to the aquifer.

Land use characteristics of the two proposed sites offer a disparity in types of uses. The Heaton Orchard site is located in a large, extensive tract of agricultural cropland (potato farms) surrounded by vacant land and open space. On the other hand, Liberty Lane is to be located close to the Village of West Kingston, which has a mixture of medium density residential, commercial, institutional and agricultural uses. Acquisition would appear to be more costly in this site than in the agricultural lands in Richmond because of possible pressures from residential development.

Land use controls in the general vicinity of the Liberty Lane well field area should be changed to assure a greater degree of protection to the groundwater resources in the aquifer. A recent zone change places the proposed well field in a medium-low density residential zone. To the south and east of the planned

site, however, the land is zoned as industrial, as is a sizeable tract to the north and west of the Village of West Kingston. Only small industries are now located in this large tract of exclusively industrially-zoned land. Industrial processing in this area should then be restricted to those locations which can tie into the proposed municipal sewerage system. Strict controls on waste disposal will protect the quality of the groundwater.

In addition, an investigation should be made of the threat of possible leaching of septic tank effluent infiltrating the aquifer from nearby areas of moderately developed residential and commercial uses. Public sewers will minimize this hazard, and bond issues have been approved to begin a municipal sewerage system in South Kingston.

Heaton Orchard well field, as explained previously, is remote from intensive development and is surrounded mainly by agricultural lands. The immediate area of the proposed well field is zoned "Residential R-40," or one acre for single-family homes. Several small areas nearby are zoned industrial, but have not yet experienced industrial development. To assure a greater degree of protection, consideration should be given to zoning the critical areas immediately surrounding the proposed well field to "Residential R-80," the lowest density zone.

With reference to possible contamination of the groundwater through infiltration, consideration should be given to the harmful effects of insecticide and chemical fertilizer used in the drainage basins. Again, strong control measures relative to agricultural drainage and waste disposal will eliminate this potential hazard.

7.8.3 Impact on the Community

In general, well fields have no appreciable impact on a community, at least when compared to surface water impoundment sites. Tax losses, relocation problems, physical effects, and ecological changes are not critical issues in the development of groundwater resources as they are in surface water cases. Consequently, public acceptance and support for groundwater exploration is favorable, especially if the source can be utilized to serve the community in which the wells are located, as is the case with the well fields in question.

Only about 20% of the estimated pumping capacity of Rhode Island's groundwater resources have been developed.[3] Analysis of groundwater resources of acceptable quality suggests sufficient quantity to supplement surface water supplies, or to serve as municipal or industrial supplies, or regional supplies serving small dispersed populations.[4] The Liberty Lane site in the Chipuxet Reservoir may be somewhat limited for use due to the high iron and manganese concentrations found in the water, although these are largely restricted to the lower aquifer,[5] leaving a substantial quantity remaining. The storage capacity of this groundwater reservoir is quite large.[6] Some surface contamination is found in both well field site areas, but overall the chemical quality of the upper Pawcatuck Basin's groundwater ranges from good to fair.[7]

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[3] Metcalf & Eddy, op cit., p. E-12.

[4] Ibid., p. E-19.

[5] Allen, Hahn, and Brackley, op. cit., p. 58.

[6] Ibid., p. 51.

[7] Ibid., p. 58.

A large undeveloped potential exists in Rhode Island for utilizing groundwater resources so that some of the pressure of development on valuable surface land and water may be relieved. It is essential, then, that potential aquifers be delineated, explored, and, if found acceptable, acquired as soon as possible to ensure their safe yields and to protect supplies from pollution and encroachment. While it may seem less urgent that well field sites be acquired in advance of use, because of the negligible physical, economic and social effects resulting from their acquisition, restrictions or advance acquisition are necessary to preserve the quality and quantity of the groundwater.

7.9 LEGISLATIVE HISTORY

7.9.1 Introduction

In tracing the evolution of the legislative history of acquisition bills since 1960, a perennial pattern emerges that is fraught with failures rather than successes. Every year since 1960, excluding 1963 and 1965, a bill has been introduced into the Rhode Island General Assembly for acquisition of either the Big - Wood or the Nipmuc - Tarkiln sites, but the record is disappointing, for only two out of the eleven bills have gained approval.[1]

Because of the complexities and intricacies involved, it is extremely difficult to identify and define, in each instance, precise reasons for the defeat of these various pieces of legislation. If any one factor is to be singled out as a major obstacle, it seems to be the entire procedural mechanism *per se* through which a bill authorizing issuance of bonds must pass. In short, to gain approval, the bill must not only be approved by the House and the Senate, but thereafter must be approved at Statewide referendum.[2] Thus, a bill must have strong backing to be passed. The subsequent chapter on problems and obstacles will delve more deeply into some of the reasons behind the public's opposition to advance land acquisition in Rhode Island.

For the most part, the legislation appears comprehensive in scope and purpose, with the contents and *pro forma* of each of

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[1] See Tables 7-6 and 7-7 for more detailed information regarding the chronological history of the various bills.

[2] See also chapter 3.

the bills being quite similar. Modifications were made over the years to improve the quality and comprehensiveness of the legislation, and these changes will be examined, especially as they relate to the subject and purposes of this study.

7.9.2 Big-Wood Rivers Legislation

The Big River and Wood River projects, designed to function in conjunction to augment the supplies of the Providence regional system, have been combined in legislation since their first introduction to the General Assembly in 1960. A total of six bills have been submitted to the Rhode Island State Legislature concerning acquisition of the Big-Wood River reservoirs. Of the six bills, only the 1964 [3] and 1968 [4] legislation was approved, as shown on Table 7-6. Few changes were made in the various bills from year to year, except for the funds requested, but the changes that were made are significant and will be discussed separately in later parts of this chapter.

Thus far, a total of $7,500,000 has been appropriated to purchase the Big River and Wood River reservoir sites. It is important to consider, however, that this $7.5 million is for

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[3] State of Rhode Island, House Bill No. H-1624, The General Assembly, January Session of 1964, approved April 30, 1964, Ch. 133, Public Laws of 1964, Passed referendum November, 1964.

[4] State of Rhode Island, House Bill No. 1592, The General Assembly, January Session of 1968, Ch. 20, Approved March 13, 1968, Passed referendum April 16, 1968.

Table 7-6

LEGISLATIVE SUMMARY

BIG-WOOD RIVER ACQUISITION BILLS 1960-1968

YEAR	DESCRIPTION	ACTION
1960	Bill for $5,800,000	Defeated by Legislature
1961	Bill for $4,000,000	Passed House, defeated by Senate Finance Committee
1962	Bill for $5,000,000	Passed Legislature, defeated at referendum
1964	Bill for $5,000,000	Passed Legislature and referendum
1967	Bill for additional $2,000,000	Passed Legislature, defeated at referendum
1968	Bill for additional $2,500,000	Passed Legislature, and passed by narrow margin at referendum

acquisition only, whereas additional funds far in excess of this amount will be needed to construct and develop these facilities. Legislation authorizing the Water Resource Board to lease the sites to the City of Providence and also authorizing the City of Providence to issue revenue bonds to fund the development of the Big River and Wood River facilities is pending approval. [5]

The following sections will trace the progress and changes in legislation for the Big-Wood facilities from the 1962 [6] bill, which was the first to make it to the referendum stage, to the last bill (1968) which passed the Legislature and was approved at referendum. Areas of specific interest, such as tax relief for communities, acquisition methods and alternatives advantageous to the property owner, and interim uses allowed, will be categorized and discussed separately.

Major Provisions.

The basic format of all the bills is identical, and all seem comprehensively written, although later bills appear more streamlined in structure. Identical in all the bills is the basic rationale for requesting the funds, i.e., that demands

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[5] State of Rhode Island, House Bill No. H-5538 Sub. A, The General Assembly, January Session of 1972.

[6] State of Rhode Island, House Bill No. H-1014A, The General Assembly, January Session of 1962, Approved April 17, 1962, Ch. 92, Public Laws of 1962, Defeated at referendum November, 1962.

are forecasted to surpass present facility capacities. Recent engineering studies tend to support this statement.

The bonds proposed to be issued to finance the two projects in all bills were tax-exempt, $1,000, forty-year (maximum) maturity bonds. Initially, interest was to be paid semi-annually with the percent to vary or to be set by the general treasurer. In 1967, [7] semi-annual interest payments were dropped in the legislation and were replaced by payment periods to be determined by the general treasurer. The 1962 and 1968 legislation places the proceeds from the bonds into a special account which is to be used for the purpose of acquiring the sites and all associated attachments, including the expenses of bond issuance. If any money was remaining, it was to be used to help acquire land for accessory uses such as pipe lines, pumping stations, and the like. The responsibility for expending the funds was placed with the Water Resource Board (called Water Resource Coordinating Board prior to 1967).

An important change occurred in 1964. Whereas in the 1962 bill, the Water Resource Board was allowed to use State lands under conditions set forth by the Governor, the 1964 bill, and subsequent bills, state that the Governor can transfer or delegate the supervision and control of State land to the Water Resources Board for use in carrying out the purposes and intent of the act. Although the resultant use of the

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[7] State of Rhode Island, Senate Bill No. S-153A, The General Assembly, January Session of 1967, Approved May 31, 1967, Ch. 197, Public Laws of 1967, Defeated at referendum June 29, 1967.

land may be the same, this clause does reflect a major policy change and an increase of the Water Resource Board's powers.

Acquisition Methods and Alternatives.

The 1962 bill gives the Water Resources Board the power to ". . . take by eminent domain or acquire by purchase or otherwise, such lands, dams, waters, water rights, (etc.) . . . as it may determine necessary or desirable for the purposes of this act, . . . "

Accordingly, the legislation grants to the Water Resource Board the basic methods and tools for acquisition by giving them the power to take by eminent domain (condemnation), purchase of fee simple, to obtain options on property, to enter into agreements whereby owners agree not to add any improvements to the property, and to enter into agreements or covenants restricting the use of property, to obtain easements, and to lease or make other concessions. It appears, therefore, that a relatively broad spectrum of acquisition methods and alternatives are open to the Board in acquiring the sites for the two reservoirs. Such a broad range of alternatives and options are extremely advantageous in land acquisition practices.

Advantages and Relief for the Property Owner.

First of all, the property owner is normally afforded some degree of protection and safeguards under the laws governing eminent domain. He is guaranteed "just compensation," which means a "fair market value" or equivalent in money for the

property taken, and, if aggrieved, he may take his case to court. Generally, public bodies attempt to be as fair as possible in purchasing land under eminent domain. Furthermore, in many programs in which the Federal government is involved financially, three or more independent appraisals are required as well as a stipulation that negotiations with the property owner must take place.

The legislation for the Big-Wood facilities also provides relief for the property owner when only part of a parcel of land has been taken by eminent domain. It gives the property owner the alternative of seeking damages, above and beyond that paid to him for his land, if, by reason of eminent domain, the remaining land still owned by the individual was lessened in value.

Also, the legislation provides that the property owner has the option of requesting the superior court to require the State to take the owner's land, and pay damages, if eminent domain proceedings have not been instituted within one year from the effective date of the legislation. This gives the owner recourse when the bill has been passed which earmarks his land for acquisition, thereby lessening the value of the land for residential or commercial purposes, but not providing reimbursement to the owner.

Tax Relief.

An avenue of relief is provided to the communities in which the land taking is proposed to occur. Tax relief is provided in the form of State payments to the community in lieu

of the taxes lost resulting from public acquisition of the reservoir site and the subsequent designation of the site as tax-exempt.

In 1962, the bill's basic requirement was that the site acquired must equal or exceed "25 percent of the assessed value of all of the real property in such city and town, not exempt from taxation . . . " If such be the case, the State would pay the town an amount equal to what it received in taxes for the properties in question or assessed on December 31, 1960. The payments would continue each year thereafter, except that they would be reduced by 4 percent each year and the State's liability would terminate after twenty-five annual payments. If additional parcels of land were acquired in future years, they would be considered separate from the initial acquisition and the Town would receive tax reimbursement on these parcels based on a similar formula. An interesting aspect of this section is that the tax reimbursement for the communities is not to be financed by the funds requested in the 1962 legislation; instead, these payments are to be annually appropriated by the General Assembly.

The 1964 bill, which passed referendum, is almost identical with regard to tax reimbursement, but it adds the stipulation that the town receiving such payments must maintain the roads bounding on the parcels to be taken for a period of ten years or at the time reservoir construction commences, whichever is shorter.

The 1967 bill also incorporates a clause pertaining to tax reimbursement to communities.[8] However, it drops the requirement that the acquired land be at least 25 percent of the assessed value of all real property not tax-exempt. This bill did not pass, and since it incorporated initial acquisition funds for the Nipmuc Reservoir as well as additional funds for the Big-Wood sites, it is questionable whether this would have superceded the 25 percent requirement of the 1964 legislation. Evidently, the 25 percent requirement has been dropped as a general policy since it is not a requirement in any of the subsequent bills for reservoir acquisition that have been introduced since 1964. However, the 1968 Big-Wood legislation that did pass referendum does not include a section on tax relief for the communities involved. Therefore, it may be concluded that any communities affected by acquisition of the Big-Wood sites would have to comply with the aforesaid 25 percent requirement, as set forth in the 1964 legislation, prior to obtaining tax relief.

Interim and Continuing Multi-Use.

Earlier versions of the Big River and Wood River bills did not contain provisions to allow multi-use of the sites, particularly for recreational purposes, and as a result both the 1960 and 1961 bills encountered strong opposition from organized sportsmen and wildlife interest groups. Together with assistance from other special interest groups, both of the bills failed to gain passage.

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[8] See also Section 6.4.

In an effort to ameliorate the discountenance of the sportsmen and recreation enthusiasts and to induce their support, the 1962 bill was modified to include a section permitting hunting and fishing and other recreational uses and pursuits consistent with the overall intended purposes of the site. Section 23 of this bill simply stated that the sites may be utilized "for such recreational purposes including hunting and fishing as the Board, with the approval of the Director of Health, shall determine to be consistent with their intended use."

Later, in the 1964 bill, and perhaps the most significant revision of the initially drafted legislation to date, was an expansion of the permitted interim uses of the sites to include "recreation, forestry, education, agricultural, and other programs of the State." These uses are subject to approval by the various State agencies having jurisdiction over the site, but they certainly offer a wide range of interim alternative uses, particularly when compared to the restrictive nature of the proposed legislation introduced earlier.

After the reservoir is constructed, continuing uses including recreation and other compatible uses of the sites shall be determined and subject to approval from time to time by the General Assembly.

Although it is difficult to ferret out exact reasons or causes attributable to the passage of the 1964 bill at Statewide referendum, which passed by a vote of 127,000 to 102,000; one can nevertheless speculate that liberalizing certain aspects of the original bill created a more favorable climate, leading to approval of the first $5,000,000 bond issue for Big and Wood River sites. The language in the 1967 and the 1968 bills covering interim and continuing uses remained unaltered from that of the successful 1964 bill.

Following some ten or more years of arduous planning and drafting of proposed legislation, acquisition of the Big and Wood River reservoir sites is close to completion with the exception of several cases still pending litigation. Progress has been slow and difficult but persistent efforts have resulted in the acquisition of these two sites. Beyond this lies the task of seeking construction monies to develop the sites, which will be exceedingly more costly, as well as additional acquisition bond issues for Moosup and Bucks Horn facilities, planned as an integral part of the total Big-Wood complex.

7.9.3 Nipmuc River - Tarkiln Brook Legislation

Legislation for the Nipmuc River Reservoir was first introduced in 1964 as a rider on the Big-Wood bill.
Since that time a number of bills have been filed to initiate

Table 7-7

LEGISLATIVE SUMMARY

NIPMUC RIVER-TARKILN BROOK ACQUISITION BILLS 1964-1971

YEAR	DESCRIPTION	ACTION
1964	Bill for Big-Wood River and Nipmuc River sites $6,000,000.	Nipmuc portion deleted, funding dropped to $5,000,000.
1966	Bill for Nipmuc River site $1,500,000.	Passed House Died in Senate.
1967	Bill for Nipmuc River site $2,000,000 Amended to $4,000,000 to provide additional funds for Big-Wood River.	Passed Legislature; Defeated at referendum.
1968	Bill for Nipmuc-Tarkiln $3,800,000.	Defeated by House Finance Committee.
1969	Bill for Nipmuc-Tarkiln $6,000,000.	Never came out of Committee.
1970	Bill for Nipmuc-Tarkiln $6,500,000.	Never came out of Committee.
1971	Bill for Nipmuc-Tarkiln $6,500,000	Stayed in Senate Finance Committee.

funding for the Nipmuc River and Tarkiln Brook reservoirs; however, no bill has yet achieved passage, and as a result acquisition of the two sites has been delayed.

Both the Nipmuc River and the Tarkiln Brook sites have been considered potential public water supply sources for many years.[9] Until 1967, when the Metcalf and Eddy report was published, the Nipmuc River site had been the only one entered in legislation, but that report recommended that the Tarkiln Brook site be developed initially and at a later date the Nipmuc River facility be installed to floodskim the seasonally high water for storage at the Tarkiln Brook reservoir. The 1969 Statewide Planning Program report supported this plan with only minor changes.

Since 1967 four bills requesting funds for both sites have been introduced to the Legislature. Table 7-7 clearly illustrates the historical fate of the bills for the Nipmuc and Tarkiln sites. Of the seven attempts, only one bill ever got to the referendum stage and it was defeated by a 16,541 to 11,892 vote. Also, it is interesting to note that acquisition for the Nipmuc site was estimated to cost $1 million in 1964; by 1970 it was estimated that $6.5 million would be needed to acquire both the Nipmuc and Tarkiln sites.

Our review of the legislation will focus on the 1967[10] and 1971[11] legislation, because the 1968, 1969, and 1970 bills ne-

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[9]Metcalf & Eddy, Inc., op. cit., pp. 55-56.

[10]State of Rhode Island, Senate Bill No. S-153A, op. cit.

[11]State of Rhode Island, House Bill No. H-1722, The General Assembly, January Session of 1971.

ver came out of committee and the 1971 bill is the most recent though unsuccessful legislation. Little change in the writing of the legislation took place between 1967 and 1971, except for the addition of the Tarkiln site and the change in funding.

Major Provisions.

The basic format and language closely resembles that of the Big-Wood bills. In fact, the 1967 bill contained a request for additional funds for the Big-Wood sites as well as the initial funding for the Nipmuc River reservoir. A noticeable change occurred in procedure for amortization of bond issues, but is not really relevant to the purposes of this report.

Acquisition Methods and Alternatives.

The powers and alternatives available to the Water Resource Board under the 1967 and 1971 Nipmuc-Tarkiln bills are, in essence, the same as those set forth in the Big-Wood bills. The 1967 bill was somewhat streamlined in format so the details of some sections pertaining to acquisition that had been present in earlier Big-Wood bills, were left out. However, they were re-inserted in the 1971 bill with little or no change in the wording.

One change in the 1971 bills, not found in the 1967 bill or any of the Big-Wood bills, is the restriction on the width of land acquired for transmission facilities. Whereas no restriction had been placed on the width of acquired land in

the 1967 bill, a two hundred-foot maximum width for transmission facility land is found in 1971. A clause allowing for certain exceptions to this width requirement is found also in the 1971 bill.

The only other change found in the 1971 bill is a section that was added to clarify the Water Resource Board's power to grant and receive leases, options, easements, etc. In other words, Section 19 spells out the types of agreements the Board may enter into, specifies the terms, and designates a fund for any proceeds received by the Board as a result of any agreement.

Advantages and Relief for the Property Owner.

As in the case of the Big-Wood bills, the property owner is protected by general eminent domain laws as established by the State of Rhode Island. In contrast to the Big-Wood bills, the Nipmuc-Tarkiln bills lack two specific provisions with respect to property owner relief. One dealt with a property owner requesting the court to require State acquisition of the owner's land if it was designated in the legislation for acquisition and if one year had expired from the effective date of the legislation without State action. The other pertained to the owner seeking damages if only a part of a parcel of land had been acquired. These two specific clauses are absent in the Nipmuc-Tarkiln legislation.

Tax Relief.

As in the Big-Wood bills, tax relief payments are to be paid to communities who have lost taxable lands because of public

acquisition under the provisions of the 1967 and 1971 Nipmuc-Tarkiln bills. The 25 percent requirement, as explained in the discussion of the Big-Wood bills, is deleted here. Therefore, no percentage of land requirement would affect the respective communities if these bills had been passed. This would have a direct impact on the communities of Burrillville and Gloucester. The sites are small compared to the total acreage of the towns and they would probably not comprise 25 percent of the taxable land in either community. Under older legislation, these communities would not qualify for tax relief. Had the 1967 and 1971 bills passed, the communities would have qualified for tax relief to be paid over a twenty-five year period, the payment decreasing by 4 percent each successive year.

Interim and Continuing Uses.

Both the 1967 and 1971 Nipmuc-Tarkiln bills allow for interim uses related to "recreation, forestry, education, agricultural, and other programs," as approved by the Governor and as regulated by departments and agencies of the State, and for continuing use as authorized by the General Assembly. This section is exactly the same as that established in the 1964 Big-Wood bill which passed referendum.

7.9.4 Special Legislation

Partial Payment for Cases in Litigation.

Because of the excessive length of time that it takes for an eminent domain challenge case to receive a decision from the courts, during which time the acquiring authority must pay interest on the entire purchase amount until date of settlement, sizeable interest payment to the land owners have resulted and, in essence, penalized the acquiring authority. To avoid this, a 1966 amendment to Title 37, Chapter 6, Section 17 of the General Laws of Rhode Island authorized the State Properties Committee to pay the owner 75 percent of the offered purchase price at the time of application to the court, the interest upon which shall not accrue during the period of litigation. This provision quarters the additional interest cost that may accrue during the litigation period and saves the State considerable money.[12]

Tuition Payments.

The State of Rhode Island has passed acts which provide reimbursement to the Towns of West Greenwich and Coventry for the cost of educating children who live in the area of the Towns which has been taken by the State for the purpose of constructing the Big-Wood River reservoirs, since, by virtue of this acquisition that area is no longer subject to taxation by the Towns.[13]

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[12] Title 37, Chapter 6, Section 17, Payment of Agreed Price for Land Condemned. RIGL 1956, as amended by Chapter 219, Section 1, Public Laws of Rhode Island, 1966.

[13] State of Rhode Island, Senate Bill No. S-834, as amended, The General Assembly, January Session of 1971, Approved July 16, 1971, Ch. 218, Public Laws of 1971. See also Section 6.4.2 for a full description and analysis of this legislation.

7.10 PROBLEMS AND OBSTACLES [1]

Perhaps one of the paramount obstacles in land acquisition is the underlying philosophy of sacrificing the rights, sentiments, and enjoyment of private parties to satisfy public needs for the benefit and good of others. Although we as Americans have set a high priority on water supply and water quality, nevertheless we are still sympathetic to the disruption and discomfiture suffered by individual land owners in the acquisition process. Consequently, water resource planners must address themselves to the problem of the interests and sensitivity of the property owners affected, even more than to the interest of local municipalities which generally have certain concessions granted to them.

Because of the aura of doubt and uncertainty that overshadows projected future demand and probability factors for future water supply needs, it is imperative that water resource planners build a strong and accurate case to demonstrate a need for the particular site, especially if the site is part of a long-range planning program. If the urgency for preservation of the site can be stressed and the public educated to the critical necessity for taking such action, then local acceptance will be in a positive rather than negative vein. If the public is not made aware of the urgency of the occasion, then local as well as statewide acceptance will be difficult to obtain. Current climatic conditions, especially prolonged drought or wet periods, can alter public opinion appreciably. In other words, people are prone to take immediate action in crisis situations, whereas they are reluctant to take a firm stand on an issue if the urgency of the situation is not immediate.

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[1] Section 8.2, Conclusions Relative to Reservoir Site Preservation in Rhode Island, should also be referred to for alternative problem solutions.

In accordance with the usual procedures followed, the acquisition of property needed for impounding reservoirs by eminent domain provides, in most cases, a clear title to all parcels in the tract, as compared to alternative methods. However, in meeting the provisions of the exercise of eminent domain, such property cannot be taken without due process and just compensation, particularly payment based on the prevailing market value of the land and improvements at time of taking. Even though the law provides for just compensation to the affected landowner, there is in many circumstances a point of conflict between the fair market value offered and what the property owner considers to be replacement value. Acquisition payments, of course, are based on fair market values, but the landowner feels he should also be compensated for certain intrinsic intangible values inherent in his ownership of the property. Despite the extreme difficulties involved in assessing what are equitable replacement costs and the absence of legislation to provide for same, the property owner still feels he is being deprived of proper reimbursement for his property. Consequently, he resorts to the courts to seek additional financial compensation, which creates additional costs and time delays for the sponsors.

Within the past several decades there has been a growing reaction from primarily rural communities concerning the alleged intrusions of metropolitan areas upon rural communities and the consumption of vast amounts of their vital natural resources to serve the needs of the urban population. A conflict therefore emerges with the small but well-organized and strongly reinforced groups representing the rural populace, who feel that the ownership of the resources within their town rightfully belongs to them and their community; they are, consequently, fighting aggressively and vociferously to protect the undeveloped resources from outside use or interference.

Accordingly, one of the major obstacles to reservoir site preservation is the deep-rooted philosophy of provincialism that seems to permeate most of the rural communities in New England. The interests and wishes of the small communities, which at one time went unheeded, have now been strengthened by the in-migration of a higher socio-economic strata joining in a common cause to stave off the urban influence and forces of growth, in order to preserve the rural characteristics of the town. Overcoming this attitude in rural New England communities will be extremely difficult.

Another traditional concept that is strongly advocated and preserved in New England, and especially in Rhode Island, is the doctrine of "home rule," or the exercise of limited autonomy in the organization and management of local affairs granted by the State to the municipality. Within certain individual communities there is a strong dedication to uphold the "home rule charter" regardless of cost, and to prevent any action that would diminish the sovereign rights so granted under the charter. To preserve this cause, local communities are vehemently opposed to any external move by the State to acquire land or adopt Statewide zoning, which is now under the authority of the local communities, or any such action that would diminish local autonomy. Such prevailing attitudes obviously hamper Statewide site preservation policies.

Similarly, the concept of regionalism, which is comparatively new, has distinct advantages with regard to land acquisition but is not fully accepted here in New England, where people are still reluctant to veer from traditional ways. Under a regional approach, consideration could be given to the equitable allocation of natural resources and tax revenues on a regional basis

rather than on an individual community basis. Unfortunately, this appears to be ahead of what New England will tolerate, at least in the immediate future. On the other hand, most of the New England states contain Regional Planning Commissions which incorporate the regional approach into water supply planning. This capability should and must be integrated with state-wide planning. However, lack of integration and cooperation in other New England states cannot be claimed as an excuse for the failure of public acceptance of reservoir planning in Rhode Island, where the State is the regional planning body. Thus, Rhode Island has made an excellent beginning by having prepared their state-wide comprehensive Water Resources Plan. The subsequent problems which face implementation of the plan appear to be mainly those of family relocation and of funds.

As pointed out above, one of the fundamental reasons for opposing land acquisition bills in Rhode Island was the notion that State taxes were already too high and that the accumulated bonded debt was approaching the threshold of tolerance. Not being faced with immediate critical water shortages, the taxpayer has only a slight regard for long-range solutions to water supply problems, whereas he places a great value and emphasis on restraining rising taxes. Therefore, the idea of receiving external revenues, other than State tax revenues, is most appealing to taxpayers and law makers alike, and would undoubtedly encourage greater support for advance acquisition, as well as softening the opposition. By way of example, highway bond issues for interstate systems have little difficulty getting approval because of the highly favorable matching basis of ninety percent Federal and ten percent State. The less the

State share, the greater are the chances for approval. Investigations should therefore be made concerning the possibility of Federal financial participation, perhaps in connection with Federally authorized water resources planning studies, such as the Northeastern U.S. Water Supply Act, involving the Corps of Engineers. Another example is illustrated with respect to the California State Water Project, a state-wide water supply development, where Federal contributions for flood control benefits and "open-space" benefits of certain reservoirs have helped to finance the project. In addition, the State intends to purchase water supply storage from a Corps of Engineers' project on a 40-year repayment contract under provisions of Section 3 of the Water Supply Act of 1958.[2]

Furthermore, additional alternative sources of funding should be explored, as the only way to avoid the problem of passing large bond issues. These will be discussed in more detail in the recommendations of Chapter 8, but a few sources can be identified here. For example, the possibility of arrangements with the Soil Conservation Service should be considered, in connection with flood control projects. In this situation the SCS would obtain the needed land and coordinate its plan with the water user, such as the State Water Resources Board.

In addition, a surcharge on the cost of private water use should be considered. This might be small initially, since other sources such as SCS, often provide a large block grant at the time of project planning or initiation of a particular project. Because there have been some questions about the legality

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[2] 1"State and Local Capability to Share Financial Responsibility of Water Development with the Federal Government," U.S. Water Resources Council, Washington, D.C., 1971, pp.65-75.

of charging for future use,[3] Rhode Island could consider passing a constitutional amendment allowing a charge for this purpose. There is precedent in that other utilities, such as electric and gas, pass on the cost of acquiring future sites to their customers. Water is at present the cheapest utility, but is fast becoming a scarce resource.

The revenue from the surcharge would be placed in a special fund, to be used as needed. Other revenue might be that accruing from interim uses of acquired sites, such as through lease-back of parcels to the original owners, subject to restrictions on the use of the parcel. A small fee might also be charged for such other interim or continuing uses as recreation, including camping, boating, hunting, fishing, etc., or forestry purposes, including timber production, agricultural or educational purposes.

With respect to the environmental accommodations and effects of a reservoir project, it should be noted that there are a number of special interest groups who have a particularly deep concern over any public project which may disrupt the natural ecological system or affect their particular interest. For example, the wildlife and sporting enthusiasts were strongly opposed to the initial legislation for the Big and Wood Reservoirs, because there were no provisions allowing recreation in the sites. Later the bill was modified to include provisions permitting hunting, fishing, and other recreational uses. In a similar respect, conservation, ecological and environmental groups are striving to maintain and preserve established ecological systems, and the installation of impoundment facilities undoubtedly has an impact on the ecosystem of the designated area. Whether the replacement of one ecosystem with another, caused by reservoir construction, is justified has to be weighed against the

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[3] Connecticut and a few other states do not allow water companies to charge customers for the cost of acquiring reservoirs in advance of their actual use.

practical aspects of providing water to one-half million or more persons. Certainly, there must be trade-offs and compromises, but water resource planners must be aware of and equipped with the answers to questions which will be generated by special interest groups.

In summary, a number of prevailing attitudes in Rhode Island must be changed before advance land acquisition is to meet with any degree of success. Many of the same arguments, as explained throughout this report, will be used repeatedly by those in opposition to advance land acquisition, and, indeed, the task of overcoming and significantly changing these entrenched attitudes will be extremely difficult.

The State of Rhode Island has approached its water resources planning in a most enlightened way, but has still had relatively little success in implementing its plans. It started with a comprehensive Water Resources Plan, designated reservoir and groundwater sites, identified individual parcels of land, tried to minimize the environmental, social and economic effects of its land takings, and prepared a plausible financial program. Yet its plans still went awry. In light of the immense local opposition and the number of families to be relocated in connection with the Nipmuc-Tarkiln project, it would appear necessary for the State to reevaluate the proposal. If then these sites were found to be the most suitable, as is likely considering the size of the State and the quality of the initial evaluation, the Water Resources Board should come forth with a stronger public information program, including the creation of Public Information Officer as discussed elsewhere, and also develop a set of alternative funding solutions. In the final analysis, however, probably nothing could engender the implementation of the development plan for water resources than another drought!

CHAPTER 8

SUMMARY AND CONCLUSIONS

8.1 SUMMARY AND GENERAL CONCLUSIONS

It was apparent in the early phases of the study that almost all Federal, state and interstate agencies concerned with water resources planning in New England were not only cognizant of the importance of reservoir site preservation, but were also undertaking steps to implement appropriate measures.

The problem then is to convince landowners and the public of this need so that the state governments will be able to pass the necessary legislation or bond issues. After the need for future additions to the water supply system is recognized and documented, the public should be educated to the necessity of early reservoir site acquisition or site preservation. The major reasons underlying this need are:

1) Increased costs, due to development since site designation

2) Increased difficulty of acquisition, also because of development

3) Relocation -need for sufficient time to relocate residences, businesses and any wildlife habitats

4) Preservation of water quality, since increased development, in the absence of controls for site protection, affect the quality of the watershed and subsequent water supply

5) Accommodation of future water supply needs, which may increase according to or beyond expectations, resulting in need for more sites

In addition, the Rhode Island case study illustrates the length of time which must be allowed for legislative authorization and appropriation of monies for reservoir site acquisition, indicating the need to preserve sites by other means than direct acquisition of fee , the most expensive means.

The major focus of this study has been implementation and analysis of appropriate planning policies for reservoir site preservation, rather than a preoccupation with the tools of site preservation, which are already extensively documented and known to water resources planners.

Briefly, the major site preservation tools are: (1) acquisition of fee simple, (2) purchase of partial rights, such as easements or development rights, (3) use of the government's police powers to restrict development, such as through state-wide zoning, and (4) tax policy incentives, which are often related to state level zoning. The first tool is often necessary in urbanizing areas which may be subject to development, but it must await legislative appropriation of funds (and often voter approval). Purchase of partial rights may be used in rural or undevelopable areas. Its cost is less than that for fee simple, while the property remains on the local tax rolls. The disadvantage lies in the restrictions placed on the land in the long term, when the reservoir may not be constructed for many years. The third approach, usually involving state level zoning of designated water supply reservoir site areas, might be questioned on the constitutionality of zoning for future uses. However, we feel that the restrictions necessary to preserve needed water supply represent a valid public purpose. If the restrictions are such that they prevent a landowner from obtaining the full benefit of his land, then he should be reimbursed. The last method, tax incentives, is often tied to state-wide zoning of potential reservoir sites, which are then eligible for property tax relief. Landowners who take advantage of the lower taxes must then abide by the zoning restrictions.

What little discussion on reservoir site preservation there is in the technical literature is, however, focused almost exclusively on the tools, with very little discussion of the specific problems and obstacles to be encountered in an attempt to apply these tools in a systematic fashion as part of a coherent planning program.

An immediate and first conclusion does relate to these tools, however, albeit in a way that may not be helpful to those seeking simple answers. We find that the diversity of cultural and physiographical settings in the New England area makes no one tool universally preferable over its competitors, and that the particular tool chosen must be tailored very closely to the site, and even tract, in question. However, the choice of tool is one that can be solved easily by a competent comprehensive planner, given an adequate informational basis for that decision. Flexibility is the quintessence of successful planning programs, and rigid plans or recommendations for the use of particular tools, are the very antithesis of that goal. The emphasis of these conclusions, therefore, is the attainment of optimal planning programs, not optimal plans. The latter cannot be formulated without reference to the framework in which the decision-makers must operate.

Further, we find that the principal obstacles to successful preservation of sites for water resources projects are institutional and sociological rather than legal or economic. Although the Rhode Island case study indicated that the public disapproved the additional tax burden put forth to pay for water supply reservoirs, their economic-based fears might have been lessened by an intensive education

campaign and by utilizing a variety of funding sources and site preservation methods. Furthermore, the diversity of legislation in all New England states pertaining to advance land acquisition suggests not so much an intrinsic legal difficulty in using the tools available, as a variety of cultural, institutional and political settings, each choosing its own way in accordance with the demands of these varied settings. The fact that certain New England states, and, in particular, the agencies responsible for water resources planning in those states, are limited in their powers to implement successful policies for site preservation is not because provisions of the Federal Constitution act as barriers, but because the state in question has, by tradition and of its own choice, placed certain restrictions on the powers of its agencies and municipalities.

In our analysis of state legislation in the six New England states, we found that Massachusetts was the most progressive in terms of the powers and freedoms it afforded its agencies to plan effectively for reservoir site preservation. But because of the diversity of institutional settings noted above, recommendations to other states to adopt a similar posture, and to pass similar enabling legislation would be dangerously utopian. Therefore, our conclusions and suggestions for planning policies and procedures for reservoir

site preservation in Rhode Island cannot necessarily be transferred to the other New England states. Our conclusions and suggestions to the Rhode Island Water Resources Board are tailored to the particular traditions and legislative history of that state, and are, therefore, considered separately in Section 8.2.

The conclusion that economic analysis of reservoir site preservation is a relatively minor problem merits some qualifications. First , the almost total absence of statistical data and documentation of successful advance land acquisition or site preservation programs in the water resources field makes a quantification of the economic merits exceedingly difficult. Consequently, the identification has rested heavily on the analysis of case study sites in Rhode Island, despite the questions of general validity that such a single focus may bring.

Secondly, although we have identified qualitatively the costs and benefits of reservoir site preservation, we have not attempted to tackle the problems of measurement. Successful measurement implies quantification; but the difficulties of quantifying the myriad of intangible social and environmental costs and benefits without an adequate statistical base are self-evident. The important point, however, is that the merits of a policy of reservoir site preservation can be successfully demonstrated on a qualitative basis alone, and therefore the lack of attaching dollar values to particular intangible items, although unquestionably important and desirable, is not a serious impediment to public and legislative acceptance, and successful implementation of reservoir site preservation. Whereas the problem is one of

funding sources rather than any lack of economic tools to demonstrate the need for reservoir site preservation, we feel that the obstacles faced by the Rhode Island legislative bills might have been overcome by a more intensive effort to explain that need to the voters and also by a greater variety of funding approaches than the revenue bond issue.

Two recurrent themes are perhaps central to successful reservoir site preservation: equity and information. In our analysis of the problems and obstacles to reservoir site preservation in Rhode Island, problems of perceived inequities were found to be an effective focus of opposition to the passage of the legislation for site acquisition. In resolution of this issue we therefore propose two practical measures.

First, we suggest that, where a water resources project results in a marketable product, the cost of that product to the consumer should fully reflect its true cost. In the case of a water supply reservoir, the costs of acquisition, and the costs of payments-in-lieu of taxes should be borne by the consumer, and not the taxpayer at large. It also follows from the desirability of equity that the donor community losing a portion of its tax base should be equitably compensated for the amount of taxes lost, not by some arbitrary formula that probably bears little relation to the actual financial loss. An annual review should be made of the property valuation and tax compensation, taking into consideration the lost development potential and the real cost of the lost property taxes to the municipality. We suggest that such measures would ease passage of appropriate legislation through the State Legislatures, because no additional burden on the taxpayer is involved. It also seems that equitable tax reimbursements would lessen community resistance to proposed reservoirs.

Secondly, we feel that more must be done for the individual landowners and residents of the proposed site relative to their perspective of inequity. The idea of an ombudsman, as discussed in Chapter 5, is of course, not new. Nevertheless, if those losing their land were to have recourse to a highly placed individual, who is above political controversy and is sensitive to the feelings and attitudes of those he must deal with, much would be achieved toward eliminating the perceived inequities that are the kernel of deep-rooted and continuing opposition toward the taking jurisdiction.

Concerning the issue of information, we conclude that what at first appears to be irrational, provincial opposition may largely be based on lack of information and often wrong information. Crash public relations programs at the time of project planning or implementation exacerbate, rather than dissipate, these misconceptions for the reasons elaborated in Chapter 5. Only a continuing public information program can hope to rectify this problem.

It is perhaps axiomatic that any statewide plan for reservoir site preservation must be formulated on the basis of a statewide plan for water resources development as a whole. In such states as Massachusetts, where there is as yet no statewide plan for water resources development, the contractor recommends very strongly that the State Water Resources Agency establish a formal mechanism for consultation with the Regional Planning Commissions in order to establish the priorities of acquisition. Many of these commissions have approved long-range plans for water supply development, and therefore coordination with the State Water Resources Agency seems mandatory.

This could easily be done administratively, rather than through legislation, by establishing an in-state reveiw procedure to supplement the A-95 review. The State of Rhode Island is a special case, in that there is only one regional planning body, namely the state-wide planning agency, and coordination between it and the Water Resources Board is exemplary.

Since the Regional Planning Commissions have experience in developing regional water supply plans, they would be quite willing to coordinate and participate in preparing a state plan and therein to integrate their own plans. The barriers to such a procedure would seem to be at the state level, where agencies are jealous of their authority or fear they have too small a budget to do more than prepare a plan within their office at the State Capitol. One would think that with a limited budget, the state agencies would welcome aid from experienced planners. The Water Resources Agency would remain the "lead agency" and the state level coordinator, while the Regional Planning Commissions would provide the sub-state input. Being more familiar with the local socio-economic, political, and physical setting, the regional commissions could advise the state as to the suitability of potential reservoir sites. With the commission as the local ally and advisor, who could present and explain the plans to the affected communities, the likelihood of the community being receptive to a water supply reservoir should increase.

8.2 CONCLUSIONS RELATIVE TO RESERVOIR SITE PRESERVATION IN RHODE ISLAND

Analysis of the case studies presented in Chapter 7 lead us to the following conclusions relative to more successful implementation of three reservoir site preservation policies.

Firstly, we conclude that the Rhode Island Water Resources Board be allowed to create a permanent staff position for a Public Information Officer,[1] and thereby institute a continuing public information program as part of its regular activities. Funding for this staff position, together with the necessary ancillary expenditure for media presentations and office overhead, should be requested within the framework of the Board's regular budget. The qualifications for this staff position should include a degree in a water resources related field, and demonstrated interest and experience in public education.

Secondly, we suggest that legislation required for site preservation include provisions for payments-in-lieu-of-taxes to be linked to actually experienced tax loss, but subject to a guaranteed minimum payment over the next 25 years. Also, both the tax reimbursements and the costs of acquisition should be borne by those who directly benefit, namely the consumers of the water supply system in question (as also discussed in Section 7.10). Numerical computations suggest that the annual per household amount involved is in the order of a few dollars. We feel that such a proposal would nullify the arguments that such programs for reservoir site preservation constitute yet another burden on the taxpayer.

Thirdly, we suggest that where preservation of reservoir sites needed only in the long-term future is concerned, the Water Resources Board consider, as a matter of high priority, the

[1] It should be noted that the Rhode Island Water Resources Board has requested funds for such an office for the last three years, but has been refused in each instance.

mechanics of a program based on first-option-to-buy at times of sale, subdivision or improvement of property located in potential reservoir sites. Such a program would require mandatory referral of a building permit application for a property located in a potential reservoir site by the local building inspector to the Water Resources Board. Similarly, subdivision applications would require referral to the Board by the Town Planning Board if approved by them. The Water Resources Board would then have a 30 or 60 day period to decide whether it wished to acquire the property. This decision would be taken in conjunction with the Statewide Planning Agency, the Department of Community Affairs, and the State Properties Committee. The purpose of liaison with statewide planning would also serve to identify bogus subdivision applications that might be submitted only in the hope that the Board might exercise its purchase option. However, if the option is exercised after approval by the planning board, the high cost of preparation of subdivision plans would tend to deter bogus applications. We feel that this scheme would find immediate application in the Nipmuc and Tarkiln Project sites. We urge that the Rhode Island Water Resources Board enter into discussion with the Providence Water Supply Board, and other water supply boards, in order to explore the possibilities of a surcharge on the price of water to finance this selective purchase scheme. Precedents for cooperation have already been established in the leasing arrangements for the Big-Wood Complex between the two Boards. While the surcharge might seem to be contrary to the policy of payment for cost of service, not cost of site acquisition for future use, there is precedent in other utilities (gas, electricity, etc.) charging customers for future planning and acquisition of sites.

The major obstacle to this first-option-to-buy approach would be the uncertainty as to when appropriations would be needed. The traditional solutions are either appropriations made individually as needed, or by way of an overall bond issue provided at the outset, and used as needed over a long period of years. We would suggest, however, that there are other methods. Revenue from the surcharge, mentioned above and in Section 7.10, could be placed in a Special Fund, to be used as needed.

Furthermore, revenue from interim uses of land needed in the long-term would supplement the Fund. In conjunction with the first-option-to-buy such land, the possibility of lease-back arrangements should also be considered. An initial large appropriation would be used to acquire several parcels of land in the site, which would then be leased to the original owner at a fair and equitable annual fee. Naturally, the land-user would be bound by a restrictive covenant limiting the uses and development of his parcel. The user fee would go into the Special Fund.

Alternatively those parcels might be leased to other state agencies for such interim uses as: recreation, including parks, playgrounds, camping, hunting, fishing; forestry, including woodland studies or timber production; agriculture, including croplands, orchards, nurseries, grazing pastures; education, such as for horticultural or environmental studies. A small fee might be charged for any or all of these uses by the managing agency to either pay for the lease or to be deposited directly into the Fund.

A fourth preservation policy might also be presented as an alternative means of acquiring and preserving sites. The Rhode Island legislature has proposed a bill, which was not enacted, to create a "Land Development Corporation."[2] This Act would

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[2] 37 RIGL 18.

have established an industrial "Land Bank" by which land is reserved for future industrial and commercial development. The administering agency is a corporation with the authority to issue revenue bonds which must be repaid solely through the revenue generated by leasing or selling the acquired land. Similarly, such a corporation could be set up to acquire water supply reservoir sites, initially funded through a general revenue bond, to be later paid and refunded by selling or leasing the sites or by selling the water to the towns to be supplied. Over the long term, the corporation, which is only concerned with water supply, could engage in long-range negotiations with such Federal agencies as the Corps of Engineers, or the Soil Conservation Service in order to plan projects with substantial Federal financial participation. These include projects which provide flood control, recreation or open space benefits (some of which are discussed in Section 3.8). Negotiations could also be commenced with neighboring states to explore the possibility of cooperative arrangements for the financing, construction and operation of water supply reservoirs.

Other revenue sources would be the same as those mentioned above relating to interim uses. Probably the major benefit of a "water supply corporation" is that its revenue bonds do not have to be approved by a state-wide referendum, because they are not backed by the full faith and credit of the state. The board of directors of the corporation should be chosen by the Governor, with the advice of a specially chosen citizen committee, and approved by the legislature. Although Rhode Island's industrial "Land Development Corporation Act" was not implemented, the reasons were legal rather than because of a lack of general support. Nevertheless, there does now

exist a similar type of corporation which has successfully developed a plan for an industrial park in the city of Cranston, with the financial support of the city, the State and the Federal Economic Development Administration. Thus, the idea has been accepted and would offer hope of a similar corporation for water supply being successfully established.

8.3 LEGISLATIVE CONCLUSIONS

In Section 6-5, the efficacy of a state-wide zoning approach to reservoir site preservation was discussed. It was concluded that, while there were questions as to the proper limits of the use of the police power in regulating property rights, regulation of wetlands if enacted to further a valid public purpose was constitutional. Even with such a valid regulation, if its application led to the deprivation of all practical use of the property, the courts could view it as a compensable taking.[1]

The use of zoning to preserve reservoir sites might be viewed not as a valid regulation under the police power, but merely as an unconstitutional method of setting land aside for a later public use. This most certainly would be the affected landowner's view. Such unresolved perceived inequities of reservoir site preservation and acquisition play a major role in the formation of public opinion that has, to date, successfully frustrated preservation policies in Rhode Island. Consequently, there must be some mechanism to allow compensation to aggrieved persons without requiring them to resort to litigation to establish that a taking had in fact taken place.

Enabling legislation could be enacted which would authorize the acquiring agency to notify the owner in writing of the restriction of the property to its present use, informing the owner of his right to reject immediately the restrictions and to seek instead a payment in fee for the full, fair market value of the property under the provisions fo the eminent domain statute.

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[1] See also 58 Virginia Law Review 5, Virginia Law Review Association, May 1972.

The owner who elects to retain title would be awarded compensation when the title to the property was later obtained by eminent domain (or negotiation) prior to the development of the site, or earlier upon the written petition of the owner. Any delayed compensation awarded would reflect the fair market value of the property at the time of the taking of the fee title, (and not at the time of restriction) and would neither reflect any diminution in value as a result of the existence of the restriction, nor any increase in value occasioned by any interim improvements not permitted under the restriction. No claim for damages due to the existence of the restriction during the preceeding interim period would be allowed. Ostensibly, if the restriction could truly be disregarded by the appraiser in the case of a postponed taking, the owner could expect to obtain a price equal to that received for comparable unrestricted property. Thus, the tendency to allow property to fall into disrepair would be avoided. The owner would be encouraged to efficiently utilize his property in the knowledge that his proper stewardship would be later reflected in a fair price.

The major problem with this approach is, as discussed in Section 8.2, the timing of appropriations for acquisition of designated parcels. This obstacle was addressed in the previous discussion of a special standing fund to be financed in part by a surcharge on the cost of water use. We also feel that a program of advanced acquisition and long-range water supply planning would be able to provide for and foresee the costs of acquisition over a long period.

A second major legislative need is to define the taking of land for future use as a present need. As noted in Chapter 3, not all states have passed legislation to permit their water resources agencies to take by eminent domain land needed for future use. Although this may be implied by case law, specific delegation of this power to the state agency is desirable.[2]

Finally, some changes may be necessary with reference to the riparian rights. New England states, not having been pressed for water in the colonial days, grew up under the "riparian rights doctrine," giving control and ownership of streams or surface waters to abutters (or riparian owners). The only restriction was that their use did not conflict or prevent the usage by other riparian owners above or below on the stream. In contrast, in the West, the arid climate had caused the states to claim all rights to waters not appropriated under the "prior appropriation doctrine." Thus, public need was placed before private use and the public had prior appropriation rights over the riparian owner.

If "the prior appropriation doctrine" were instituted in the New England states, an abutter who did not use his water for any purpose need not be compensated, and waters need not be taken, since they would be constitutionally under control of the State. The states would be responsible for compensating landowners only when lands were taken for reservoirs. The merits of this suggestion have been recognized by others.

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[2] See also Section 3.3, footnote 55.

For example, the Committee on Water Laws of the Irrigation and Drainage Division of the American Society of Civil Engineers,[3] recommended to:

> Declare all water in its natural environment to be public wealth and a natural resource, subject to appropriation.[4]

Connecticut has very recently passed legislation in this area which will indeed effect precisely these changes.[5]

In summation, however, a legislative approach to an optimum reservoir site preservation policy is not an essential prerequisite to the implementation of that policy when there is an optimum water supply planning program. Such a program to develop long-rang planning alternatives which accomodate the state, regional and local perspectives must be based on the desirability and, indeed, the necessity of acquiring or otherwise preserving water supply sites. The continuing state-level public information effort previously discussed is one component of that program and involves both the public, who are directly affected by reservoir projects, and the local governments, who act directly in decisions relating to water supply, water pollution control, land use planning and regulation and open space acquisition and protection. The comprehensive water resources plan, as an integral part of a state land use plan,

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[3] "General Statement of Principles to be included in State Water Rights Laws," Committee on Water Laws of the Irrigation and Drainage Division, Vol. 98, No. IR 2 (June 1972).

[4] Ibid., p. 317.

[5] Public Act No. 229, "An Act Concerning Instantaneous Minimum Flow of Rivers and Streams," 1971 session.

is another component essential to the credibility of a water supply reservoir site preservation policy. In view of the scarcity of sites throughout the New England region, such a state plan should give consideration to inter-state cooperation with respect to developing adequate water supplies. Finally the economic component of a water supply planning program is, of course, of major concern to the taxpayers. Therefore, reservoir site preservation is an economical policy because of the otherwise increased costs associated with acquisition of designated sites on which development has taken place, the subsequent difficulty of acquisition resulting in greater transaction costs, more numerous relocation costs, treatment of water, the quality of which may have deteriorated due to such development, and finally those costs for acquisition of more or other reservoir sites if and when the water supply needs increase. On the other side of the economic aspect of reservoir site preservation is the need to explore all alternative and supplemental funding sources, including an increase in the price of water use to reflect the actual cost of preserving and supplying water. Local, state, inter-state and federal financial participation in planning, preserving, acquiring and developing water supply reservoirs should be encouraged so that the taxpayer does not bear a disproportionate burden of the cost of a resource which is necessary to the public health and welfare.

APPENDIX A

DEVELOPMENT OF A DECISION RULE FOR LAND ACQUISITION BY THE PRIVATE SECTOR

Introduction

The land speculator is a type of advance land acquisition specialist, and often performs a very useful function to society. He searches for parcels of land whose value he thinks will increase rapidly in the future, and buys them in order to be able to preserve them for that more valuable future use. He bids up the land prices in the process, thus ensuring that the land will be used for those purposes which will produce the most income.[1] The land speculator is the intermediary between the land owner, who may not have much knowledge of potential future demands for his land, and the future land purchaser, who may have little knowledge of the present land market, and who may well not even be considering the possibility of presently expanding to the area where he will eventually locate.

Many private manufacturing firms are also involved in advance land acquisition. When a firm locates a new facility, it will often purchase more land than is needed to satisfy immediate plans in order to have room for future uncertain expansions. The following analysis establishes some typical decision-rules for the private sector. These rules are essentially similar to those applicable to public agencies;

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[1] This may be an overly rosy picture of the operations and accomplishments of the land speculator. The land speculator responds to prices, and where those prices do not accurately represent social values from society's standpoint, he will make correspondingly bad decisions.

both have to compare the benefits of advance land acquisition against its costs. The only difference between the decision criteria of the private firm and those of the public agency wishing to reserve land for some future project is in the way the benefits and costs are measured.

The Land Speculator

The land speculator's decision criteria for land investment are relatively straightforward. First he must estimate what income he expects from the land. This would include both the income from the ultimate sale of the land, and any income received from the land before he sells it. He then estimates how much it will cost him to purchase and maintain the land. This would include both the original purchase price and taxes paid on the land, and any costs associated with maintaining the land or with providing interim income. He would then compare his expected costs and his expected benefits (after computing the present value of all future expenses and income), and would invest or not invest depending upon whether the benefits exceeded the costs.

In the simplest deterministic model, we can assume that the land speculator knows definitely the year in which he will sell the land, the price he will receive for it, the amount of income he will receive, and the amount of taxes he will

pay on the land in the interim. His decision rule, under these conditions, is as follows:[2]

$$\frac{P_T}{(1+i)^T} \quad \sum_{t=0}^{T} \frac{I_t}{(1+i)^t} \gtrless P_0 \sum_{t=0}^{T} \frac{\alpha_t}{(1+i)^t} \qquad \{DR\text{-}1\}$$

P_T = The price of the land when it is sold in year T.

I_t = The interim income received from the land in year t.

i = The discount rate.

P_0 = The present cost of the land.

α_t = The taxes to be paid on the land in year t.

The left-hand side of this expression represents the income (benefits) that the land speculator will receive from investing in the land. The right-hand side represents the costs

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[2]All the mathematical formulations presented in this Chapter are in terms of discrete intervals. This implicitly assumes that only once, at the end of the year, will the prospective purchaser decide what to do with the land (sell it, build on it, or keep it). In reality, of course, such a decision can be made at any time, and these formulations should be expressed as integrals rather than summations. Although this could be easily done, the reason for adopting the discrete form of analysis is that it is generally less intimidating, and its loss of precision is undoubtably much less than the estimating errors which would enter into these calculations.

he will experience by investing in the land. If the left-hand side is larger than the right-hand side, he should invest; if it is smaller, he should not.

In this simple formulation, the selling price in year T is treated as a certainty. However, the prospective speculator can only estimate on the basis of past trends, future prospects, and intuition what the selling price will be. In fact, for any year in the future there is some (subjective) probability distribution of prices. Such a distribution might look like that indicated in Figure A-1. It is unlikely that the price will be as low as P_1, more likely that it will fall in the range between P_2 and P_3, and very unlikely again that it will be as high as P_4. Assuming that the investor puts no special value (either positive or negative) on taking a risk per se, the expected value of the price of the land would be the summation of the products of the different prices multiplied by the probability of their occurring, or:

$$E(P_t) = \sum_i P_i \cdot \Pi(P_i)$$

$\Pi(P_i)$ = The probability of occurrence of price, P_i

The expected value, $E(P_t)$, would be equivalent to the term P_T, if t= T. The amount of interim income to be received from the land and the amount of taxes to be paid on the land

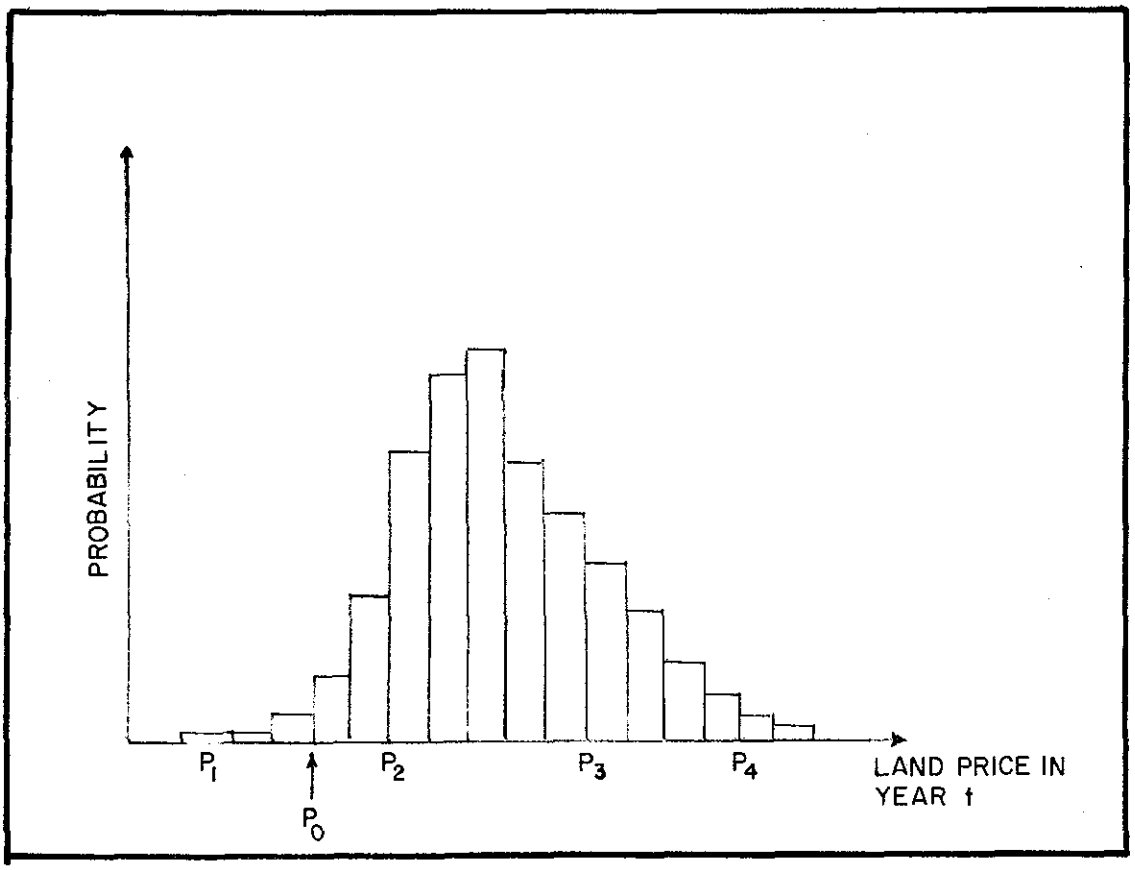

Figure A-1: DISTRIBUTION OF FUTURE LAND PRICES

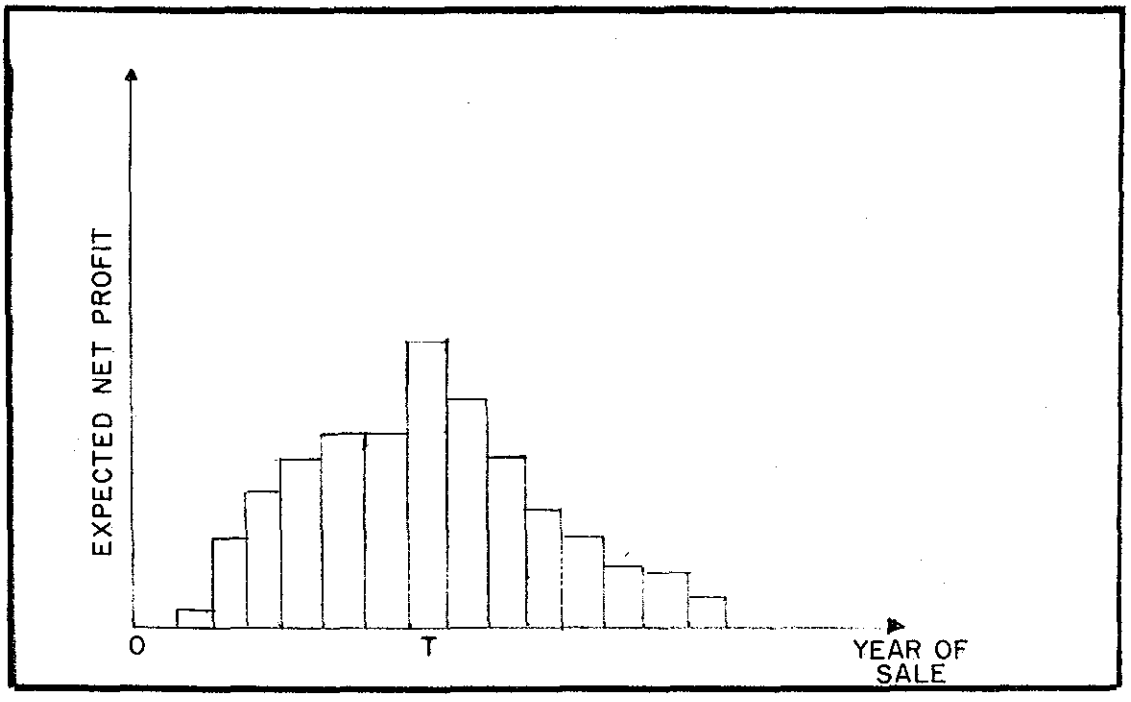

Figure A-2: DISTRIBUTION OF FUTURE NET PROFITS

in any year are also uncertainties and should be estimated in the same manner. Thus, the terms P_T, I_t, and α_t in Equation 1 should all be replaced by their expected values, namely $E(P_T)$, $E(I_t)$, and $E(\alpha_t)$.

Subtracting the value estimated for the right-hand side of this equation from that estimated for the left-hand side in any year gives the expected net profit from the investment if the land is sold in that year. Figure 2-1 illustrates a plot of such expected net values for different years. The optimal time to sell is that year in which the expected net profit is at a maximum, thus defining the year T as shown on Figure A-2.[3]

The Private Firm

A private firm whose primary interest is to reserve a suitable site for future expansion rather than to merely speculate would have a somewhat more complicated decision rule than the land speculator. The firm would begin by making essentially the same calculations, but some of the future benefits would

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[3] After his initial purchase, the speculator would be essentially recomputing these expressions every year until he finally sells the land. In these future estimates, the price at which he could sell the land when he makes his computation (which is the opportunity cost to him of not selling the land) would replace the term P_0 in the original expression DR-1 He would sell the land as soon as his calculations indicated that the costs began to exceed the benefits to be expected from keeping it.

be estimated differently. Interim income benefits would remain the same. The future benefit would not be the price at which the firm could sell the land, but what it would save by not having to buy the land in the future. This amount might be the same as the sales price, P_T, if no improvements had been made to the land in the interim. However, if capital improvements are expected to be made on the land, then the firm will also have to pay for the depreciated value of these improvements to the extent they are immobile. The firm's benefit would then include price of both the land and the depreciated capital improvements, and this might be significantly larger than that anticipated by the land speculator.

The limit to this expected benefit is the increased costs which the firm would experience if it located its new facility at the best alternate site available at the time of its expansion, rather than at the original site selected in advance. These increased costs could take any or all of three forms. First there would be the increased construction costs associated with an inferior site. Second would be the increased operating and maintenance costs associated with the inferior site. (These costs might result from increased raw materials costs, increased transportation costs, increased labor costs, etc.) Thirdly, the alternate site might not be able to support as much production capacity as the original site (for example because of a lack of cooling water), and

the firm would experience reduced profits resulting from reduced production. These costs would be computed as follows:

$$U_T = C_1 + \sum_{t=T}^{T+T'} \frac{C_2(t)}{(1+i)^{t-T}} + \sum_{t=T}^{T+T'} \frac{C_3(t)}{(1+i)^{t-T}}$$

U_T = The cost of locating on the best alternate site other than on the site acquired in advance.

C_1 = The increased investment cost associated with locating on the best alternate site.

$C_2(t)$ = The increased operating and maintenance costs in year t associated with locating on the best alternate site during the life of the new facilities.

$C_3(t)$ = The reduced profits attributable to lower production capacity imposed upon the firm in year t by limitation of the best alternate site.

T' = The economic life of the facilities to be built on the new site.

Under the simplest assumptions -- that the firm is certain that it is going to expand and is certain when it is going to expand -- its decision rule would be very similar to the land speculator's decision rule:

$$\frac{E(W_T)}{(1+i)^T} + \sum_{t=0}^{T} \frac{E(I_t)}{(1+i)^t} \quad P_0 + \sum_{t=0}^{T} \frac{E(\alpha_t)}{(1+i)^t} \qquad \{DR\text{-}2\}$$

$E(W_T)$ = The expected value of the land to the firm when it expands. This is either the amount it would cost the firm to purchase the land then, or the cost of locating in the best alternate site, whichever is less.

This formulation assumes that the firm definitely will expand. An adjustment could be made which would take into account the fact that the firm may not decide to expand to this site in year T even if the site is acquired in advance. In this case we can assign some probability to the firm's using the site, and assume that, if it does not use it in that year, the site will be sold. The decision rule in this case would be as follows:

$$(1-\beta_T) \frac{E(P_T)}{(1+i)^T} + \beta_T \frac{E(W_T)}{(1+i)^T} + \sum_{t=0}^{T} \frac{E(I_t)}{(1+i)^t} \gtrless P_0 + \sum_{t=0}^{T} \frac{E(\alpha_t)}{(1+i)^t} \qquad \{DR\text{-}3\}$$

β_T = The probability of using the site for the firm's expansion (assuming that there is no uncertainty about the fact that the firm will expand in year T, whether or not it uses this particular site, and that it will sell the land if it does not use it).

Decision rule DR-3 is still somewhat idealized. It is unlikely that any firm will have such definite knowledge about the specific date when it will use or sell its property. In the more normal case, the firm would be uncertain both about when and if it will expand. In this case, every year after it acquires the land the firm will have to decide whether it will build on the land, sell the land, or save the land for use or sale in the future. If the firm saves the land, then it will have to make the same choice the following year, and so forth until it finally decides either to build on or to sell the property.

This situation results in a much more complicated decision calculus than any of the previous decision rules. The firm is proceeding down a decision tree such as that shown in Figure A-3. In any year, there is some probability β_t of the firm building on the land, some probability ϕ_t of the firm selling the land, and some probability ω_t of the firm saving the land. Since these are the only three things that the firm can do with the land, the sum of these probabilities $\beta_t+\phi_t+\omega_t$ must equal one. There is some probability that the firm ultimately will not build on the land, so the sum of the building probabilities must be less than one, and the sum of the selling probabilities must be greater than zero; however, the sum of the building and selling probabilities $\sum_{t=0}^{\infty} \beta_t + \phi_t$ must ultimately equal one.

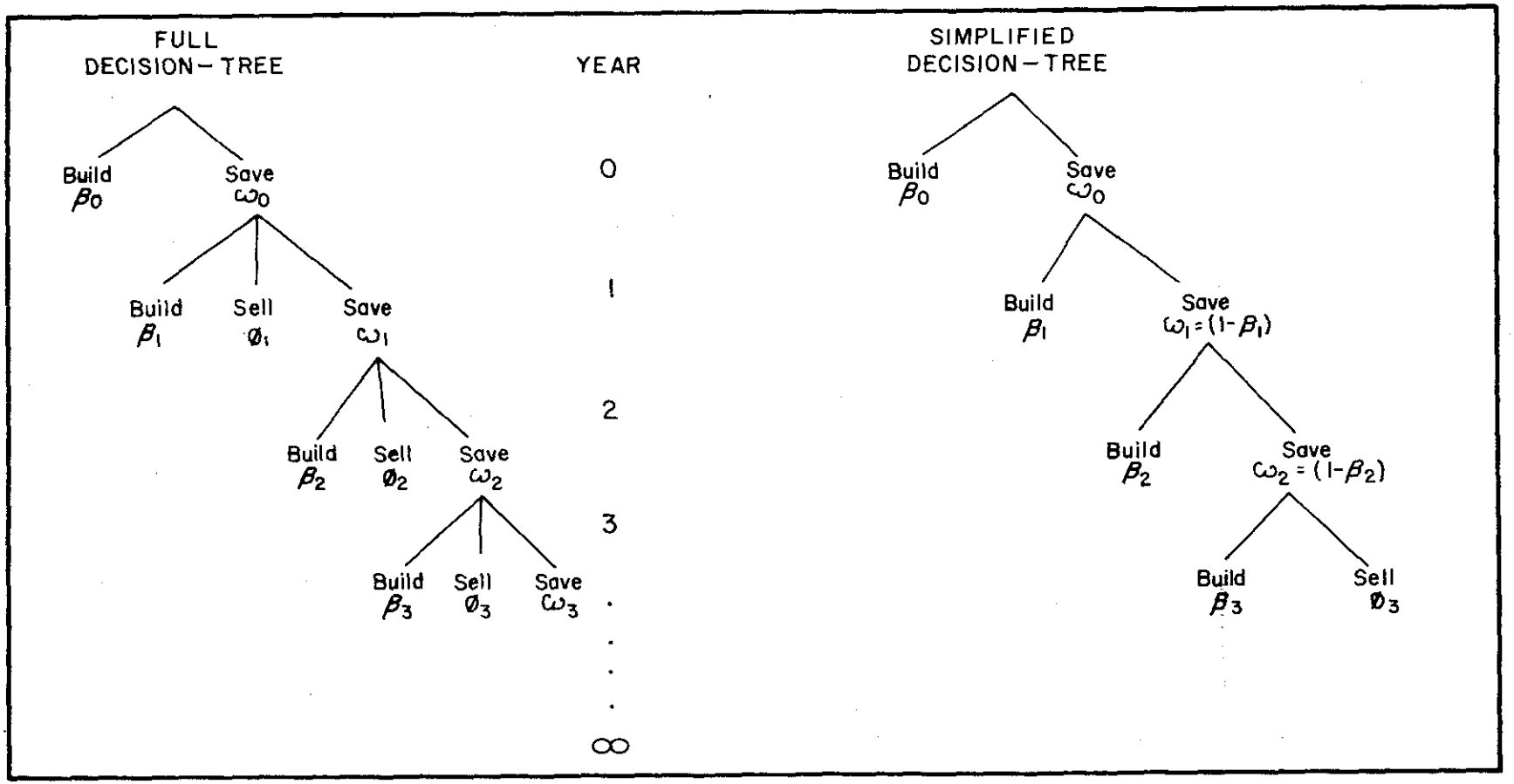

Figure A-3: DECISION TREE FOR THE PRIVATE FIRM

In this most general case, the total benefits to be expected from advanced acquisition of the land would be the sum of:

1. all the expected benefits in the build column (the probability of building in any year times the savings expected from having reserved the land for building in that year), discounted to the present.

2. all the expected benefits in the sell column, discounted to the present.

3. all the expected benefits in the save column (the probability of saving the land in any year times the interim income that would be realized from that land, discounted to the present.

The total costs of advance land acquisition in this case would be the initial purchase price plus the sum of all the expected costs in the tax column (the probability of saving the land for a year times the expected tax to be paid on the land during that year), discounted to the present. Then the decision rule would be the same as the preceding decision rules: the firm would compare the present value of all the expected benefits with the present value of all the expected costs, and would invest in the land if the former exceeded the latter. We will call this most general case Decision Rule 4.

Some simplifying assumptions may be necessary, because ex ante assignment of probabilities is very difficult. The first assumption we can make is that the profitability to the firm of its expansion is so large relative to changes in the magnitude of the terms $E(I_t)$, $E(\alpha_t)$ and $E(P_t)$ that the latter three terms will have a negligible effect on the decision whether the firm should expand in any year or not. This means that the probabilities of using the land are generated internally to the firm's planning process, depending solely upon the firm's financial status and market success. In this case the building and not-building probabilities, β and $\omega + \phi$, could be set by the firm's planners. However, the decision between selling and saving the land would still not be trivial.

To make this decision rule practical, we must hypothesize a relatively crude but not unreasonable planning process. Given the high degree of uncertainty about future conditions, probably the best we can expect from the planning process is something like the following:

> There is a probability of β_1 that we will use the land around year $t=1$; and if we don't use it then there is a probability of about β_2 that we will use it around year $t=2$; and if we don't use it then there is a probability of about β_3 that we will use it around year $t=3$; and if we don't use it then, we might as well sell it.

This information is sufficient to estimate the relative benefits and costs of advance land acquisition -- assuming, of course, that someone can estimate the magnitude of the costs and benefits associated with these probabilities. The information results in the simplified decision tree shown in Figure A-3, but now there are only three branches, and the probability of selling is set at zero for all but the last time period, t_3 . Thus the calculation becomes quite manageable, and is probably as accurate as could be expected from a more complicated calculation.

APPENDIX B

EVALUATION OF THE FOUR-ACCOUNT SYSTEM AS PROPOSED BY THE U.S. WATER RESOURCES COUNCIL AS A FRAMEWORK FOR THE ECONOMIC ANALYSIS OF RESERVOIR SITE PRESERVATION

The United States Water Resources Council has established standards for evaluating water and related land resource projects.[1] These standards list four criteria, based on different national objectives, which should be used in evaluating proposed projects. The four objectives are:

1. National Economic Development.
2. Environmental Quality.
3. Social Well-Being.
4. Regional Development.

In this appendix the benefits and costs previously discussed will be allocated among these different objectives, and a rough estimate made of their relative importance. Of course, the actual levels of the various benefits and costs identified for any particular site will depend very much on the specific conditions and development prospects for that site and alternate sites. Nevertheless, it is possible to make some general comments on which factors will probably be more important in an evaluation, and whether negative or positive impact will probably result.

There are some difficulties in assigning the costs and benefits elaborated in the previous sections to any one parti-

[1] Water Resources Council, "Proposed Principles and Standards for Planning Water and Related Land Resources," Federal Register, Vol. 36, No. 245 (December 21, 1971), pp. 24144-24194.

cular account. The four account system was established primarily as a tool for the evaluation of water resources and related land resource projects. However, the economic analysis of this study is not concerned with the merits or demerits of, or alternatives to, the project itself; indeed, we have assumed that the project will ultimately be built and the costs and benefits of advance land acquisition have been defined relative to a future acquisition. Much of our analysis is concerned with transfers from one group of individuals to other groups, and, as we shall see, transfers from one account of one group to a different account of the other. For example, the elimination of speculation may be considered a social well-being benefit to society as a whole; but to the land owner who speculates this is a real economic loss.

National Economic Development.

"National economic development beneficial effects are increases in the output of goods and services and improvements in national economic efficiency."[2] Benefits resulting from net increases in the outputs of goods and services are clear. The meaning of increased economic efficiency, however, is not. In this study we will define an efficient change as one that satisfies the conditions of a Pareto Optimum move; i.e., where at least one person is made better off without anyone being made worse off.

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[2] Ibid., p. 24146.

Because it is not clear whether the proposed criteria intend this meaning for the term "efficient," the following discussion will distinguish benefits and costs resulting from increased or reduced goods and services from those benefits resulting from increased or reduced efficiency.

Increased Goods and Services.

There are no present benefits taking the form of increased goods and services. Interim benefits taking this form are the production of marketed (agricultural commodities, etc.) and non-marketed (recreation, flood control) goods from the reserved site. The benefits of increased open space and wildlife habitat are similar non-marketed outputs and should be included, but there is no methodology for evaluating their monetary equivalent.

Future benefits from increased goods and services include the following:

- The prevention of uneconomic developments (This represents an increase in the output of goods and services since it is preventing the wastage of productive capital.)

- Reduced transaction costs (to the extent they are marketed). The monetary transactions costs represent the value of real resources such as labor which are consumed in the process of making a transaction.

- Improvements in surrounding developments. Many of the future costs associated with improved surrounding developments represent real resource savings (reduced transportation costs) or external economies (the prevention of undue excess capacity as in the case of the store located outside the reservoir site in Figure 4-2).

Increased Efficiency.

That part of the savings in appreciated land values resulting from the difference between social and private discount rates is an efficiency benefit. This does not increase the output of goods and services, but does make at least one person better off without making anyone worse off.

Reduced Output of Goods and Services.

The Water Resources Council standards are very explicit about including the cost of the land as a national economic development cost, whereas we have argued that this is only a transfer payment. Presumably, their argument is based on the assumption that land prices represent the capitalized value of the profit which the land is expected to earn. Since we are counting the productivity of the land separately, including the purchase price of the land would be double counting, and therefore this cost should not be included in the calculations.

The interim costs are the net increased production costs of enterprises which would have located in the reservoir site,

[3]Defined on pages 4-7 to 4-9.

but, with advanced acquisition, locate elsewhere; and the additional costs experienced by people surrounding the reservoir site, resulting from advanced adjustments.

The future costs are the costs of wasting resources through planning inertia and the perpetual increased adjustment costs which would be experienced if the project is never built.

We have identified no costs which reduce economic efficiency without reducing the output of goods and services. In attempting to evaluate the importance of these benefits and costs we can assume that the interim costs would be greater than the interim benefits. It is unreasonable to suppose that the land will be put to better use when constrained by government restrictions than it would be in the free market. Perhaps the highest interim use for the land is thought to be for such public purposes as recreation or fish and wildlife habitat. In this case it should be assumed that the government would place it in this use even if there is no advanced acquisition for the reservoir. The social productivity of the land under advanced acquisition must be assumed to be less than or, at best, equal to its productivity without government control. However, if we assume a reasonable homogeneity of land in the region of the site, these net costs will probably be fairly minor. If the land is not homogeneous, they might become important.

The future benefits are more important, and the prevention of uneconomic capital improvements on the land is undoubtedly the most important. However, the reduced transactions

costs may also be important. Resettlement costs should be much less under advance acquisition.

The importance of the difference between the social and private discount rates depends upon what numbers are used. There has been a steady trend over the past decade to increase the discount rate used in evaluating Federal water resource projects, to the extent that the Water Resources Council now suggests a rate of 7 ½ percent.[4] Figure B-1 shows the present worth of one dollar at up to one hundred years in the future when discounted at 7% and at 9%. The latter percent rate might be considered an appropriate private discount rate. The present value diminishes rapidly in both cases, and the difference between them is not very great (as indicated in Figure B-1). It reaches a maximum of slightly less than 9 cents on the dollar after about fifteen years, and then begins to decline until it is almost zero. As an example of how much effect this would have upon an evaluation of a proposed purchase, assume the following:

- The present price of the land is $1,000,000.
- The project will be built in twenty years.
- Land values are expected to increase at 5% per year over this period.
- The social and private discount rates are 7% and 9% respectively.

Under these conditions the benefit from the difference in

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[4] Ibid., p. 24167.

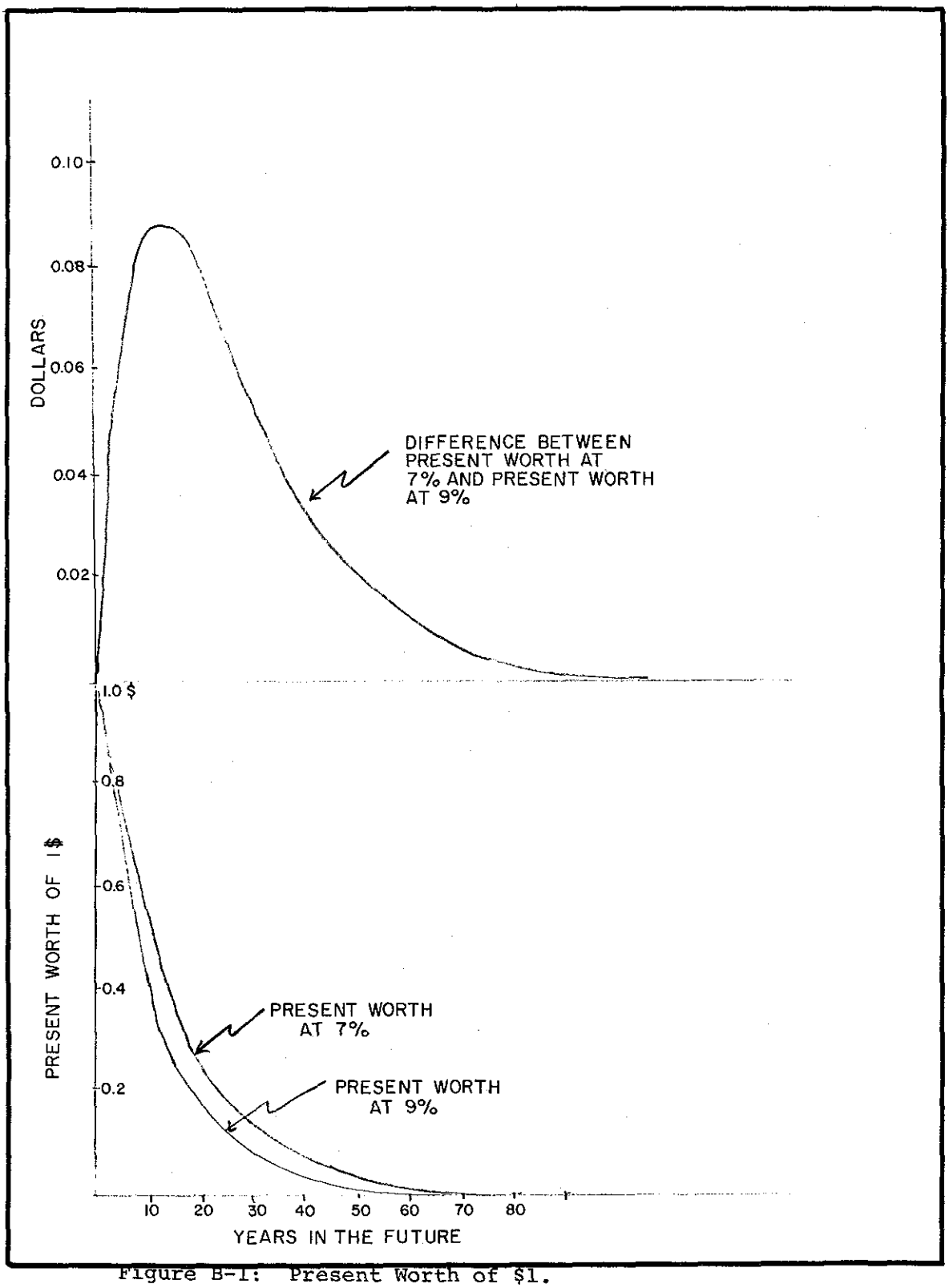

Figure B-1: Present Worth of $1.

discount rates will only be:

$$(1{,}000{,}000)\ (1.05)^{20}\ (0.08) = \$210{,}000$$

where the 0.08 factor is taken from Figure B-1.

In summation then, the most important national economic development benefit that can be quantified would seem to be the prevention of uneconomic capital improvements.

Environmental Quality.

Environmental quality benefits are defined by the four account system as follows:

> Environmental quality benefits are contributions resulting from the management, preservation, or restoration of one or more of the environmental characteristics of an area under study or elsewhere in the Nation. The measures used to describe these benefits will vary, depending on the specification of the environmental characteristics.
>
> The benefits of a plan may include:
>
> a. Management, protection, enhancement, or creation of open and green space, wild and scenic rivers, lakes, beaches, shores, mountain and wilderness areas, estuaries, or other areas of natural beauty;
>
> b. Management, preservation, or enhancement of especially valuable archaeological, historical, biological, and geological resources and selected ecological systems;
>
> c. Enhancement of the quality of water, land, and air by control of pollution;

d. Prevention of erosion and restoration of eroded areas; and

e. Preservation of freedom of choice to future resource users by actions that minimize or avoid irreversible or irretrievable effects.

The environmental benefits are all interim benefits and result from the land serving as:

- open space
- a recreational resource
- a wildlife habitat
- a storage basin for flood waters
- a means to stop adverse environmental effects.

These benefits can be claimed only to the extent that the land would have been developed in the absence of advanced land acquisition. For example, such developments might have produced erosion, which may be prevented by advanced acquisition precluding the development. The only way to evaluate the environmental benefits is to predict the environmental damage which would have resulted from the interim alternative uses. The value of the land as open space or for recreation or fish and wildlife habitat will also depend upon the availability of other such areas in the region.

Environmental quality costs were defined by the four account system as follows:

> Environmental costs are consequences of a proposed plan that result in the deterioration of relevant environmental characteristics or reduce freedom of choice of resource users in the area under study or elsewhere in the Nation. These in-

clude:

a. Inundation, adverse alteration, or decreases in use of open and green space, wild and scenic rivers, lakes, beaches, shores, mountain and wilderness areas, estuaries, or other areas of natural beauty;

b. Inundation, deterioration, or disruption of especially valuable archeological, historical, biological, and geological resources and ecological systems;

c. Deterioration of quality of water, land, or air resources;

d. Increased erosion; and

e. Irreversible and irretrievable commitment of resources which minimizes or precludes the freedom of choice of future resource users.

The only environmental quality cost we have identified is the non-maintenance of tenant-occupied structures (Section 4.4.8).

Social Well-Being.

Benefits to social well-being were defined by the four account system as follows:

> Social well-being benefits resulting from a plan are contributions to the equitable distribution of real income, employment, and population; contributions to the security of life and health; provision of educational, cultural and recreational opportunities; and contributions to national security. These benefits may occur in the area under study or elsewhere in the Nation. The measures used to describe these benefits will vary but when possible will be in dollars, other quantitative units, or qualitative terms.

These benefits include:

a. Increased real income of persons or groups defined as being relevant to evaluation of a plan;

b. Contributions toward achieving specified goals for population dispersal and urban-rural balance through improved distribution of population and employment opportunities;

c. Enhancement of the security of life and health by reducing risk of flood, drought, or other disaster and by minimizing hazards to health and safety;

d. Improvement of conditions contributory to attainment of economic stability;

e. Provision of educational, cultural, and recreational opportunities; and

f. Contributions to national security by providing reserve capacities in water resource systems and protection against interruption of the flow of essential goods and services at times of critical need.

In general, it is very difficult to predict the effect of advance land acquisition upon most of these factors. The effects would depend upon the specific socio-economic characteristics of the land owners and other individuals involved, as well as their individual and collective value systems. The advance acquisition itself will have negligible effect on the distribution of income (the land owner will simply be exchanging one type of asset for another) except through some of the transfers listed above. These include the transfers away from the potential land speculator to the public (probably a benefit since land speculators are apt to be more wealthy than the average taxpay-

er); away from the local taxpayers to the national taxpayer (depending upon the average wealth of the local citizens); and away from present and future land owners (to the extent they have an inaccurate view of future land prices).[5] It is unlikely that any of these transfers, except for the tax transfer, will be of great importance.

Similarly, there will be no significant effect upon population distribution. Population that would have been locating in the reservoir site will now locate elsewhere, but the alternate site is likely to be similar in terms of its relative location in reference to an urban area, so there will be no effect on the urban/rural population distribution.[6]

The major positive effect on social well-being, other than the provision of goods and services discussed above, will be the prevention (or at least minimization) of community disruption that might otherwise result without advance acquisition (provided of course that the reservoir <u>is</u> ultimately built!). Such disruption would negatively affect both the people who would locate in the reservoir and those surrounding the site. In this sense, advance land acquisition may

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[5]It is possible, of course, that their view is more accurate than the public agencies, in which case the public's inaccuracy would result in a transfer away from the taxpayer to the land owner.

[6]The only case in which such a shift can be claimed is when the reservoir site provides unique facilities for a development, and this development will not be undertaken if the reservoir site is pre-empted. In such a case, one might argue that the site reservation will keep more people in the urban area than would have been there otherwise.

minimize the economic and social disruption of the affected communities in the region.

The advance acquisition would probably do nothing to promote national security (unless the ultimate construction of a project promoting this objective could not have been undertaken without the advance acquisition), and would do as little to promote the security of life or health (except to the extent that the site's interim use as a flood storage basin protected lives and health downstream).

Social well-being costs were defined by the four accounts system as follows:

> Social well-being costs of a plan are adverse consequences on the components of this objective in the planning area and elsewhere in the Nation. Social well-being costs include:
>
> a. The reduced real income of persons or groups, defined as being relevant to evaluation of a plan, due to taxes, reimbursement charges, and other adverse economic effects of a plan;
>
> b. Adverse concentration of population or employment contrary to specified goals;
>
> c. Increases in hazards to life, health, or safety;
>
> d. Adverse effects on economic stability;
>
> e. Adverse effects on educational, cultural, and recreational opportunities; and
>
> f. Overloading capacities of water resource systems and increasing the risk of interruption in the flow of essential goods and services needed for special requirements of national security.

The only social costs identified in this study are the social costs of uncertainty (Section 4.4.6), which may be considered as a detriment to the mental health of project site residents, and the social costs of planning blight (Section 4.5.2).

Regional Development.

The regional development objective is concerned with the effects of the proposed investment upon the income, employment, environment, social well-being, and other aspects of the regional economy which would have a significant effect upon the course and direction of regional development. The impact of any particular project or undertaking will, of course, depend upon how broadly the "region" is defined. The impact might be very significant on the particular localities in the site area, but almost unnoticeable over the broader region.

The major economic effects on regional development would probably be negative. First there is the problem of "planning blight" which we anticipate would be more in evidence with advance acquisition. A second problem is the transfer of receipts away from the local governments. Both of these would be interim costs in terms of regional economic development. A future benefit would be the better planning, lower economic and social costs, and increased stability associated with the more rational location of land use and developments around the reservoir site.

In terms of the region's natural environment, advance land acquisition would probably have a beneficial effect as out-

lined above, and this might promote regional development.

Conclusion.

In the opinion of the contractor, the four account system is not a particularly helpful device in the identification of costs, benefits and transfers associated with advance land acquisition. As noted previously, many of the important items are transfers, which, under the four account system, would require a triple bookkeeping; four accounts each for society as a whole, the acquiring jurisdiction and the project area. Almost all the costs and benefits to environmental quality, social well-being and regional development that must be considered in evaluating advanced land acquisition, can as yet only be expressed qualitatively. Yet many of the costs, benefits and transfers that we have identified must be assigned to more than one account; and this raises the problem of apportionment of a non-quantifiable item. Consequently we have not attempted to devise a bookkeeping system or a systematic tabulation of each of the four accounts.